The Effects of Coaching Novice Special Education Teachers to Engage in Evidence Based Practice as a Problem-Solving Process

DISSERTATION

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Abstract

Evidence-based practice (EBP) in special education may be conceptualized as a problem-solving process. Novice special education teachers infrequently possess the skills necessary to engage in EBP to identify problems and select and adapt empirically-supported treatments (ESTs) to implement in their classrooms. This study used a multiple baseline design across four novice special education teachers to evaluate the effects of coaching on fidelity with an EBP action plan protocol. Results indicate that coaching effectively improved teacher fidelity with the protocol and that teachers were able to implement self-designed plans with high levels of fidelity in the classroom. Additionally, participants indicated overall satisfaction with the goals, procedures, and outcomes of the study, suggesting that coaching on EBP may be a socially valid model of support for novice special educators.

Keywords: evidence-based practice, teacher preparation, professional development, problem-solving
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**Fields of Study**

Major Field: Educational Studies

Area of Emphasis: Special Education and Applied Behavior Analysis
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Chapter 1: Introduction

Despite the numerous empirically supported treatments (ESTs) for improving student outcomes that have been identified; research-based interventions are used less frequently than practices teachers select based on their preference and experience (Cook & Cook, 2013; Cook, Tankersley, & Landrum, 2013). Teachers who fail to rely on scientifically proven methods deprive students with disabilities of the effective instruction they so desperately need (Vaughn & Dammann, 2001). Use of ESTs requires teachers to engage in a series of problem-solving steps (i.e., identifying the area of student need, selecting and adapting an appropriate EST, and then implementing the EST and monitoring its effect on student performance). Unfortunately, special education teachers often do not possess the skills needed to make the types of data-based decisions encompassed in a problem-solving process (Jimenez, Mims, & Browder, 2012). Closing the achievement gap between learners with disabilities and their typically developing peers will require bridging the research-to-practice gap (Burns & Ysseldyke, 2009).

Burns and Ysseldyke (2009) surveyed 174 special education teachers and 333 school psychologists and found that participants reported using ineffective practices as frequently as they used empirically supported techniques. In a survey of 49 special educators, Boardman and colleagues (2005) found that the majority of participants did not consider a research base as an important criterion for selecting instructional procedures. Synthesizing information collected via interviews, observations, and self-
report measures from 10 novice special education teachers, Jones (2009) found low rates of reported use of research-based procedures; these ratings were verified during direct observation of the participants in practice. Further, low levels of correspondence were found between what teachers said they were doing in their classrooms and their observed behavior. Even when teachers reported using procedures that had supporting scientific evidence, they were infrequently observed to actually implement those procedures. Despite the wide range of empirically established interventions available for classroom use, it seems that many educators remain unaware of their promise or existence (Torres et al., 2012).

**Distinguishing ESTs from Evidence-Based Practice**

There is considerable variance in terminology used with respect to practices supported by research (i.e., ESTs) and the evidence-based practice (EBP) of the profession of special education. Teachers need to understand what EBP is in order to effectively engage in the process (Freeman & Sugai, 2013; Slocum et al., 2014). Although many researchers advocate the use of the term *evidence-based practices* to describe procedures backed with high-quality research indicative of their efficacy in achieving meaningful student outcomes (Cook & Cook, 2013; Cook & Odom, 2013; Cook et al., 2013; Torres, Farley, & Cook, 2012), others propose reserving the term EBP as a referent to a recursive problem-solving or decision-making model (Spencer, Detrich, & Slocum, 2012). According to the American Psychological Association Presidential Task Force of Evidence-Based Practice (2006), *empirically supported treatments (ESTs)* are those interventions backed by rigorous research; alternatively, *evidence-based practice in psychology (EBPP)* refers to “the integration of best available research with
clinical expertise in the context of patient characteristics, culture, and preferences” (p. 273). Restricting EBP to a list of interventions that qualify as evidence-based only if meeting rigid criteria limits the number of intervention options available for practitioners (Slocum et al., 2014). In this paper, evidence-based practice (EBP) will refer to a problem-solving process that can be used by teachers to make decisions in light of the best available evidence and the unique needs of their students. ESTs refer to the research-based procedures that teachers select, adapt, and implement when they engage in EBP. Conceptualizing EBP as a process or framework may encourage teachers to act as informed problem-solvers whose professional wisdom is respected and whose skill in making educational decisions is valued.

In special education, the EBP movement has gained momentum as a foundation for decision making across staff including teachers, assistants, behavior specialists, school psychologists, principals, and administrators (Detrich, Slocum, & Spencer, 2013). Framed as an approach to instructional problem solving, EBP uses the context and students’ needs and values as the basis for the selection of ESTs from the best available evidence; and it allows the practitioner to exercise professional judgment (Cook et al., 2013). Put this way, ESTs explicitly articulate the role of evidence as the foundation for decision making in education, while EBP refers to a teacher’s professional behavior in a way that aligns with conceptualizations in other fields such as medicine, psychology, and law (Slocum et al., 2014; Spencer et al., 2012; VanDerHeyden & Harvey, 2012). EBP encompasses what the field of special education holds as a core tenet: the use of educational practices that have been proven effective through reliable research to improve student learning and behavioral outcomes (Cook, Tankersley, & Harjusola-
Webb, 2008). Teachers are the ones who ultimately decide whether and how ESTs are implemented in their classrooms (Boardman, Arguelles, Vaughn, Hughes, & Klinger, 2005; Cook et al., 2008); therefore, they should be taught to engage in EBP as a recursive model to guide decision making.

**EBP: A Problem-Solving Framework**

The most powerful tool available for special educators in justifying educational decisions and gaining independence from decisions imposed upon them by other decision makers (e.g., principals, school boards) is arguably a working knowledge of scientific findings (Vaughn & Dammann, 2001). EBP as a problem-solving framework enables teachers to select issues of social significance in their classrooms and to adapt scientific findings to their unique situations. Detrich and Lewis (2013) suggest that there are three interdependent phases of EBP in education: identification, implementation, and evaluation. These phases can be further broken into a series of five steps modeled from the framework outlined by Spencer and colleagues (2012) to be used when solving problems or making instructional decisions: (a) pinpointing the problem, (b) selecting an EST, (c) adapting the procedures, (d) implementing the EST, and (e) monitoring progress. Teachers may address the first three steps by creating EBP action plans that guide them through steps four and five.

**Pinpoint.** To begin, it is necessary to identify the problem. That is, special education teachers must first identify some aspect of student academic or social performance that is inadequate (Spencer et al., 2012). Teachers must determine characteristics of the student and instructional context in addition to the nature of the problem. Useful information to include in an EBP action plan is the number of students
and their age or grade level and disability. In schools using the response to intervention (RTI) process, teachers should match the area of student need to the corresponding RTI tier and then identify the setting where the intervention is to occur and whether other students or teachers will be present during implementation.

**Select.** Once the problem has been identified, teachers must select an EST from the best available evidence, factoring in both the relevance (i.e., applicability in a given context) and certainty (i.e., quantity and quality) of the evidence (Slocum et al., 2014). At present, a rigorous and systematic database is not available to support educators in identifying all promising ESTs (Freeman & Sugai, 2013). Best available evidence is a fundamental construct of EBP that fortunately offers a viable alternative to approaching EST selection. It suggests that practitioners choose ESTs according to the available quality and quantity of evidence, relevance to the identified problem, and “contextual fit” (Albin, Lucyshyn, Horner, & Flannery, 1996; Detrich et al., 2013). Evidence should be drawn from the findings of various research methodologies provided they appropriately address the research questions and are conducted with adherence to the scientific process (Freeman & Sugai, 2013; Slocum, Spencer, & Detrich, 2012; Slocum et al., 2014; Vaughn & Dammann, 2001).

**Adapt.** After an EST has been selected, the teacher must again apply professional wisdom, adapting it to fit the needs and goals of the individual students with whom it will be implemented (Cook et al., 2008). This step of EBP is critical, because an otherwise powerful EST that is not adapted to the local circumstances may be rendered ineffective (Spencer et al., 2012). Available resources and personnel must also be considered, along with the classroom culture or current practices being used in the classroom (Detrich,
An all-around beneficial step of the process, adapting ESTs gives teachers ownership of the practices and increases the probability of effectiveness and continued usage (Torres et al., 2012).

**Implement.** Once adapted for the particular student needs and classroom setting, teachers must implement the EST, maintaining fidelity to the critical features of the practice. Poor intervention implementation is arguably the greatest threat to EBP in education (Detrich & Lewis, 2012); yet, fidelity is subject to the influence of many contextual variables including child characteristics, resources, and goodness-of-fit between the current classroom practices and new procedures (Detrich, 1999). Bridging the research-to-practice gap requires that ESTs are implemented with high levels of fidelity so that their potential for improving student outcomes may be fully realized; however, since the emergence of EBP in education, relatively little attention has been paid to the science of implementation (Cook & Odom, 2013; Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005). Despite a body of knowledge of “what works,” an empirical understanding of “how” yields uncertainty in the identification of the critical features of ESTs. Fortunately, monitoring teacher fidelity alongside student outcomes can shed light on the matter. Indeed, measurement of implementation fidelity is critical to formulating conclusions about the effectiveness of an EST (VanDerHeyden & Harvey, 2012).

**Monitor progress.** Monitoring progress is the fifth step of the EBP problem-solving framework. Student progress is not to be assumed simply because the procedures being used have empirical support (Cook et al., 2008; Freeman & Sugai, 2013). Just as student need varies according to the individual, student response to intervention varies
according to the individual. It is a reality of education that no practice will work for every learner (Cook & Odom, 2013). Comparing baseline performance to post-intervention progress provides the ultimate measure of EST effectiveness (Detrich, 1999). Teachers can monitor process by graphing and visually assessing student data to see the extent to which the student’s trajectory is likely to lead to expected annual growth in performance (Johnson & Street, 2013). When students are not progressing as expected, teachers should review fidelity data to ensure the EST is being implemented correctly. If the EST has been implemented with fidelity for at least a few weeks, teachers are justified in increasing intervention intensity or selecting another procedure to adapt and implement (Torres et al., 2012). Teachers who collect and analyze student data in an ongoing fashion are able to make data-based decisions concerning curricular adjustments (VanDerHeyden & Harvey, 2012), and the effectiveness of doing so has been established empirically (Stecker & Fuchs, 2000). In order for student data to be meaningful to teachers, however, they must be taught how to review it and to make instructional decisions (Jimenez et al., 2012).

Preparing Teachers to Engage in EBP

Special education and general education teachers alike lack sufficient training in the implementation of scientifically based procedures (Gable et al., 2012). Teacher shortages and attrition are particularly salient issues in special education, underscoring the imperative for better preparation and the need to equip special educators with techniques proven to ameliorate academic and social problems in the classroom. Special education teacher shortages are exacerbated by high rates of attrition, resulting in nearly one million students with disabilities in the United States receiving services from
untrained or inadequately trained teachers (Tyler & Brunner, 2014). Novice special education teachers face particular difficulty as they transition into the field during their initial years of teaching (Jones, 2009); an estimated 50% attrite in the first five years of teaching, a rate that nearly doubles the general education teacher attrition rate (Tyler & Brunner, 2014). Although collaborative problem solving is commonly assumed to be an integral component of the induction of new special educators, novices tend to feel overwhelmed and unsupported in their first year (Hobbs, Day, & Russo, 2002).

Workplace decision making has been identified as one of the six primary factors contributing to special educator attrition (Tyler & Brunner, 2014). Teacher satisfaction can be greatly enhanced when educators are equipped with the ability to engage in EBP and permitted to do so in their work environments. Teachers must feel that their instructional freedom and professional wisdom are valued if they are to engage in EBP (Cook et al., 2008), and they are more likely to view research positively when they feel that it helps them to solve problems in their classrooms (Boardman et al., 2005). Professional judgment is a critical component of EBP (Spencer et al., 2012), and framing EBP as a problem-solving approach empowers teachers as leaders across the decision-making stages of identification, implementation, and evaluation.

Traditionally, it has been the school psychologist’s role to provide problem-solving consultation. This process typically involves the consultant working with the teacher to identify a particular student problem and then creating an intervention plan for the teacher to implement (Feldman & Kratochwill, 2003). The consultation process is terminated when the problem is successfully (even if only temporarily) resolved. Although problem-solving consultation can be effective, it presents two issues that could
be minimized if the teacher were equipped with problem-solving skills: skills learned in consultation infrequently generalize to other students with similar problems (Feldman & Kratochwill, 2003), and when old problems resurface or new ones arise, teachers rely on the consultant to come to the rescue. A preferable approach may be for the special education teacher to independently engage in EBP. The school psychologist could then assume a coaching role, assisting the teacher to troubleshoot as needed and providing performance feedback on procedural fidelity. This approach may increase teacher confidence and be practical for addressing a wider range of academic and social student issues.

**Teaching Problem Solving**

There is minimal evidence in the research literature suggesting that preservice teachers are explicitly taught to engage in EBP as a recursive problem-solving model. Preservice teachers may receive instruction on specific ESTs while in their preparation programs, but they repeatedly fail to generalize those skills in their own K-12 classrooms (Gable et al., 2012; Scheeler, Bruno, Grubb, & Seavey, 2009). Many special education practitioners indicate undifferentiated usage of or preference for ESTs versus practices without empirical support (Burns & Ysseldyke, 2009). Teachers have cited inadequate preparation in ESTs as the reason for lack of implementation (Gable et al., 2012). Further, comprehensive training in collecting and analyzing data as an integral part of the instructional cycle seems to be lacking from many teacher preparation programs (Santi & Vaughn, 2007). Jimenez and colleagues (2012) reported that 31 special education teacher participants were not able to identify data patterns or make instructional decisions on a pretest that presented hypothetical student data, but they were able to acquire the skills
through explicit training. However, the extent to which acquired instructional decision-making skills generalized to the classroom was not evaluated. Boardman et al. (2005) observed that even special educators who cited the importance of adapting instruction to the needs of individual students spent little or no time monitoring progress during reading, nor did they provide differentiated instruction or consider research findings when selecting interventions.

Few studies have attempted to address problem solving or instructional decision making (Choi & Lee, 2009). Hobbs and colleagues (2002) examined the use of online forums to support new teachers in problem solving. Two interdisciplinary groups, each consisting of two preservice teachers, one first-year teacher, and one university faculty member, were established; and they utilized a virtual conference room to post problems throughout the school year and receive advice from their group members. After a brief, in-person training, all problem-solving activities occurred online. A total of 14 problems were addressed across groups, and participants rated the procedures to be highly socially valid (Hobbs et al., 2002). However, the authors did not employ an experimental design or conduct direct observations to determine the extent to which the virtual interdisciplinary groups influenced teacher behavior in the classroom. Further research is needed to determine whether virtual problem solving support is a viable and effective means of supporting novice special education teachers as they engage in EBP.

RTI is a framework that has gained popularity since the passage of IDEA (2004) because the legislation permits its use as a method for determining whether students qualify for special education services (Fuchs & Fuchs, 2006). A relatively new approach for increasing the extent to which children in the U.S. are effectively educated, RTI
constitutes a paradigm shift within special education, and the movement is widespread from early childhood to secondary settings (Greenwood, Carta, Buzhardt, Walker, & Terry, 2007). In an RTI framework, there are multiple tiers of intervention through which increasingly intensive services are provided with progression across tiers (Daly et al., 2007). At the core of RTI are evidence-based interventions, procedures for monitoring progress, and instructional decision-making; yet, insufficient instruction in problem-solving skills during pre-service and in-service training may preclude teachers from engaging in RTI (Albritton & Truscott, 2014; Daly et al., 2007). The challenges of improving teachers’ skill in using a problem-solving framework to make data-based decisions through the use of high quality professional development (PD) has seldom been explored in the research literature. In a study with general education and special education elementary level in-service teachers, Albritton and Truscott (2014) conducted PD workshops to increase participants’ perceptions of their ability to engage in RTI as a problem-solving process. The fact that problem-solving skills and student outcomes were not directly measured prohibits drawing conclusions regarding the extent to which those skills generalized or improved student performance.

Choi and Lee (2009) explored the use of an online case-based learning environment for classroom management problem solving (CBL-CMPS) to address preservice early childhood education teachers’ ill-structured problem solving. The authors defined ill-structured problems as the messy type encountered in real-world settings as opposed to the well-structured problems that are typically analyzed in university classrooms. Performance on a case problem before and after training was the measure used to assess the effects of CBL-CMPS on teacher candidates’ acquisition of
seven problem-solving sub-skills. Pre-service teacher responses to questions regarding the case problem were evaluated by independent observers using a rubric, and results indicated that a case-based learning approach may be useful in promoting problem-solving skills (Choi & Lee, 2009). The problem-solving sub-skills emphasized did not include elements of EBP (e.g., selecting, adapting, and implementing ESTs and monitoring progress); rather, the emphasis was on evaluating multiple perspectives in a given situation and incorporating those views in proposed solutions. CBL-CMPS was defined as a constructivist learning environment model, and problem-solving skills were not explicitly taught. Further, the generality of this approach to solving actual classroom problems was not assessed, and there was no mention of how the approach improved student outcomes. It remains unclear whether a case-based approach may be suitable for helping novice special education teachers to engage in EBP.

Kennedy and colleagues (2012) utilized a combination of content acquisition podcasts (CAPs), case studies, and feedback to maximize instructional time in teaching disability characteristics and evidence-based procedures in an introductory special education course with pre-service teacher candidates. Podcasts covered content and were accessed outside of class time, and case studies involved the in-class application of skills to hypothetical case studies involving students with disabilities. In addition, feedback on knowledge of the disability and integration of ESTs as evidenced in the case reports was provided. Student performance on case studies improved over the course of the semester, suggesting that the instructional approach was effective (Kennedy, Newton, Haines, Walther-Thomas, & Kellems, 2012); however, no empirical conclusions are warranted due to the non-experimental nature of the study. Further research is needed to determine
whether this model is functionally related to increased knowledge and skill among pre-service special education teachers.

Seven full-time graduate students pursuing master’s degrees in special education participated in a single-case design study examining the impact of training on teachers’ reflective patterns as documented by daily journal entries (Dieker & Monda-Amaya, 1997). The researchers identified seven problem-solving components and used a multiple baseline design to demonstrate training effects on the number of components per journal entry. Initial training that consisted merely of an introduction to effective instructional practices did not affect problem solving skills; teachers required direct instruction on the elements of the problem-solving framework. Explicit training resulted in an increase across teachers in their degree of reflection on classroom problems encountered during clinical practicum experiences, but these results did not generalize across teachers in their second practicum placement, and there was no assessment of student performance (Dieker & Monda-Amaya, 1997). These findings suggest that problem-solving skills can be explicitly taught to pre-service teachers; however, the extent to which journaling reflections of classroom issues impacts teaching behavior in the classroom and maximizes student outcomes is unknown. In addition, the problem-solving framework used in this study did not address the recursive nature of problem solving or require the selection of ESTs and evaluation of student performance. Additional research is needed to determine whether reflection on the problem-solving process results in teacher and student behavior change.

In a study examining the impact of training teachers to interpret CBM data and create observable and measurable objectives, Codding and colleagues (2005) found that a
package including modeling, practice, and performance feedback was effective. The researchers used a multiple baseline across participants design to demonstrate that following individualized instruction, teachers correctly analyzed simulated and actual student CBM data and generated technically adequate IEP objectives (Codding et al., 2005). This study supports the notion that teachers can be explicitly taught progress monitoring and problem identification skills such as analyzing data and writing instructional objectives, but it did not evaluate these skills as part of a larger problem-solving process.

The Responsive Educator Program (REP) for pre-service teacher preparation utilized Teaching/Learning Projects (TLPs) within the context of an early field-based course to yield data on candidate practice and student outcomes (Maheady, Jabot, Rey, & Michielli-Pendl, 2007). Qualitative and quantitative data were collected to evaluate the planning, instruction, and ESTs used by 422 undergraduate students enrolled in general education programs during their formal field work experiences. TLPs involved designing, teaching, and evaluating two formal lessons; one included the explicit use and monitoring of an EST. Teacher candidates evaluated lesson efficacy using pre and posttests, and they submitted their TLPs complete with student outcome data. TLP rubrics were used by teacher educators to assess candidate performance, and results revealed that across four semesters, over 800 lessons were implemented using ESTs with high levels of fidelity. Importantly, greater than 60% of lessons taught resulted in significant student outcome improvements and another 23% of lessons yielded marginal increases (Maheady et al., 2007). This descriptive study offers a promising approach for teaching pre-service
candidates to engage in EBP and highlights the value of including student outcome measures in the analysis of a pre-service teacher’s preparedness and effectiveness.

Novice teachers should not only be taught how to use a handful of ESTs (Bain, Lancaster, Zundans, & Parkes, 2009); they should also learn to apply an EBP framework to troubleshoot the ever-changing, wide-ranging issues they will encounter daily throughout their careers. It is particularly important for teachers of students with disabilities to be equipped with the skills necessary to engage in data-based decision making and EBP (Jimenez et al., 2012). Programming for generalization may be a missing link in teacher preparation (Scheeler et al., 2009); coaching in EBP may promote generalization. Coaching special educators to problem solve “may have wider generality than training in the application of set solutions” (Hundert, 1982, p.121). Conceptualized as a technique for programming for generalization, problem solving may act as a mediated response (Stokes & Baer, 1977). That is, teachers may use EBP as a mediating response in untrained situations to generalize their skills and solve new problems.

**Purpose**

School failure, drop-out, and lack of productivity and independence in adulthood are undesirable outcomes associated with ineffective instruction (Jones, 2009). Instructional and behavioral plans for students with disabilities require precision, and there is no room for recovery from practices that ignore scientific findings for these students (Vaughn & Dammann, 2001). Inadequately prepared teachers are unable to help students with disabilities achieve their true potential (Gable et al., 2012). Teacher preparation programs are in a unique position to tackle the research-to-practice gap in that they can equip new teachers not only with the skills necessary to engage in EBP, but
with an appreciation for teaching as a scientific endeavor (Jones, 2009). There is a pressing need for increased skill among teachers in problem solving and data-based decision making (Albritton & Truscott, 2014).

EBP is a problem-solving framework in which novice special education teachers should be trained. It is a recursive process that involves pinpointing academic and social student problems; selecting, adapting, and implementing ESTs; and monitoring student progress. Educators and researchers involved in teacher preparation and PD are faced with a formidable task in training teachers to engage in EBP. Exposure to ESTs is insufficient in preparing teachers to implement them in the classroom (Gable et al., 2012). With limited empirical knowledge, methods for best facilitating acquisition, fluency, maintenance, and generalization of EBP skills remain uncertain. One promising approach may be coaching.

It is imperative for researchers to recognize the need to support special education teachers in the implementation of scientifically proven strategies in classrooms. More research is needed on teacher preparation issues such as how teaching practices are developed and influenced by experience and how these teaching practices ultimately impact student outcomes (Maheady et al., 2007). In addition, research on how to best provide teachers support in EBP is needed. Specifically, the examination of coaching as an approach to developing novice special education teachers’ EBP repertoires may result in a promising methodology for adoption by teacher preparation and PD programs. The current study extended the existing literature with the purpose of evaluating the effectiveness of coaching on improving teachers’ procedural fidelity with the first three steps of EBP (i.e., identifying the problem, selecting and adapting an EST). Additionally,
the relationship between coaching and teachers’ implementation fidelity was examined, as well as the extent to which teachers were satisfied with the goals, procedures, and outcomes of coaching.

**Research Questions**

1. What are the effects of coaching on novice special education teachers’ fidelity with creating EBP action plans to problem-solve simulated scenarios?

2. What are the effects of coaching on novice special education teachers’ fidelity with creating EBP action plans to problem-solve actual scenarios?

3. To what extent do novice special education teachers implement their EBP action plans with fidelity to address actual classroom scenarios?

4. Are the goals, procedures, and outcomes of coaching on EBP as a problem-solving process considered to be socially valid by novice special education teachers?
Chapter 2: Literature Review

Scientific research has led to the identification of numerous practices proven effective in helping students achieve their potential; implementation of these empirically driven strategies is vital to the success and advancement of all learners, particularly those with special needs. Novice special education teachers must be equipped with techniques that are known to be effective if the achievement gap between exceptional learners and their peers is ever to close (Vaughn & Dammann, 2001). Applying science in education can be difficult however, and this is especially true in special education where students require individualized instruction. Despite a continually expanding body of research documenting effective interventions for improving child outcomes, a gap between knowledge and practice persists (Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005).

Indeed, a failure to translate research findings to service delivery models is apparent in special education. This should be alarming to stakeholders concerned with outcomes for children at home, classroom, and community levels, as important advancements and changes in what is considered best practice have occurred in the past 30 years (Odom, 2008). Although tremendous progress has been made in the empirical identification of procedures appropriate for classroom use, identification of what works by researchers does not automatically result in implementation by teachers. When research findings do make their way into classrooms, the extent to which procedures are implemented with fidelity is infrequently monitored or explicitly supported; even despite
widespread belief that in order to be effective, interventions must be used accurately (e.g., DiGennaro Reed & Codding, 2014; Greenwood, 2009; Grow et al., 2009). In the absence of careful attenuation to procedural fidelity, the gulf between research and practice enlarges (Hagermoser Sanetti & Kratochwill, 2009).

**Procedural Fidelity**

At the crux of intervention science is the empirical demonstration of a systematically manipulated independent variable yielding measurable changes in the dependent variable (Gresham, 2009). Conclusions regarding such demonstrations are dependent upon the extent to which the independent variable was implemented as designed (Barnett et al., 2014). Procedural fidelity is a measure of the completeness and consistency in the delivery of essential procedural elements (Hagermoser Sanetti & Kratochwill, 2009). Procedural fidelity is fundamental to the wide-spread adoption of practices that are supported by evidence demonstrating measurably superior outcomes (Greenwood, 2009). Conceptualized as a mediating variable that connects an educational practice to learner outcomes (DiGennaro Reed & Codding, 2014), procedural fidelity is the ultimate link in connecting research to practice and achieving desired results. Data collected on procedural fidelity serve as quality controls that can be used to ensure procedures are accurately transferred from research to practice (Greenwood, 2009). Although the concept of procedural fidelity has gained popularity in recent decades, much work remains for researchers, teachers, and other stakeholders concerned with intervention science in education (Barnett et al., 2014; DiGennaro Reed & Codding, 2014; Gresham, 2009; Hagermoser Sanetti & Kratochwill, 2009).
The development of evidence-based interventions has preceded theoretical and empirical advancements in procedural fidelity. Moreover, the concept of procedural fidelity is referred to in various ways across disciplines concerned with the delivery of intervention services to individuals (Gresham, 2009). In the fields of applied behavior analysis and school psychology, treatment integrity is a term commonly used to describe the notion of implementing procedures as intended (Grow et al., 2009; Hagermoser Sanetti & Kratochwill, 2009). Medical professionals refer to the concept as treatment compliance or treatment adherence, whereas nutritionists use the term dietary adherence (Gresham, 2009). A necessary step in a scientific pursuit of the concept is the use of precise language. It may be argued that the best term to capture this construct is procedural fidelity because it encompasses the full range of procedures and relevant dimensions that a practitioner may be trained to implement (DiGennaro Reed & Codding, 2014). That is, the extent to which a protocol for an empirically supported assessment, treatment, or other procedure is implemented as designed is best referred to using the overarching term procedural fidelity (DiGennaro Reed & Codding, 2014).

**Measuring procedural fidelity.** A variety of methods to measure procedural fidelity with varying levels of strength concerning the conclusions they warrant are found in the research literature. In a review of 187 articles that reported procedural fidelity by target variable and implementation agent, Barnett and colleagues (2014) found that the majority of studies used a checklist or rating scale during direct observation to collect procedural fidelity data. Other methods included self-report, direct observation without a checklist or rating scale, informal observations, and permanent products. Similarly, in a review of 266 articles that reported methods used to document procedural fidelity in
school-related intervention research, direct observation was used most frequently across all intervention types (Barnett, 2014). It is encouraging that direct observation appeared to be the most popular method for measuring fidelity because this type of measurement yields the most compelling data from which conclusions can be drawn (Johnston & Pennypacker, 1993; Hagermoser Sanetti & Collier-Meek, 2014).

Various dimensions of a procedure may be measured to capture the construct of procedural fidelity including content, quality, quantity, and process (Hagermoser Sanetti & Kratochwill, 2009). Content and quality are perhaps the most commonly assessed dimensions, measured as the number and accuracy of steps implemented using an implementation checklist or task analysis of the procedure (DiGennaro-Reed & Codding, 2014). Procedural checklists consist of the discrete, observable behaviors that comprise a procedure, and while observing the teacher implement the procedure, an observer uses the checklist to indicate which steps were implemented correctly. Then, a percentage is calculated by dividing the steps implemented correctly by the total number of steps and multiplying by 100. Alternatively, the quantity of a practice (i.e., how much of the procedure was provided) may be the procedural dimension of interest. For example, behavior specific praise is an empirically supported practice for improving student behavior that can be summarized as one discrete behavior; therefore, the appropriate dimension to use in measuring fidelity may be quantity (i.e., the number of times a teacher makes behavior specific praise statements during an observation). Observers may use event recording to record each instance of one or more discrete teacher behaviors such as praise statements or reprimands, and this count may be reported as count or rate (Cooper, Heron, & Heward, 2007). Process is the dimension of procedural fidelity that
refers to how the intervention was delivered (Hagermoser Sanetti & Kratochwill, 2009). It may be measured as a contrast in the frequency between intervention or assessment procedures to other responses. For example, the contrast between positive and negative teacher-student interactions may be of interest, reported as the ratio of behavior specific praise statements to reprimands.

In order to be successful, efforts to improve the implementation of empirically supported teaching procedures must incorporate data from applied researchers and address the contextual factors necessary to facilitate practitioner success (Fixen et al., 2005). Simply defining a practice or program as evidence based does not lead to the transfer of science to service, and a passive process of publishing research and expecting practitioners to “take it from there” is not effective in promoting implementation (Fixen & Blasé, 2009). The ongoing support teachers receive after being introduced to a new practice is a key ingredient for implementation success (Harper & Maheady, 1991). There is a need for the development of an implementation infrastructure through which research can be utilized with sufficient quantity and quality to yield intended results (Fixen & Blasé, 2009). Professional development (PD) and implementation science must be integrated in a proactive approach that considers all relevant areas (Odom, 2008).

The quality of services for students with disabilities under the Individuals with Disabilities Education Act (IDEA) hinges on the quality of the professionals and paraprofessionals with whom they interact (Bruder, Mogro-Wilson, Stayton, & Dietrick, 2009). A wide range of disciplines comprise this workforce, including special education, occupational and physical therapy, social work, nursing, and speech and language pathology. Individuals across these professions differ markedly in training, licensures or
certifications, experiences, and even philosophical paradigms. Despite these differences and insufficient training in working collaboratively, professionals servicing students with special needs are expected to do so in the implementation of research-based practices (Bruder et al., 2009). Although the importance of high quality education providers is increasingly recognized, those responsible for the PD of practitioners continue to rely on ineffective methods (e.g., one-time trainings) that are inconsistently effective and unlikely to yield maintenance or generalization in practice (Wilson, Dykstra, Watson, Boyd, & Crais, 2012).

**Improving procedural fidelity.** Activities designed to enhance the knowledge and skills of those in the workforce are generally categorized as PD (Bruder et al., 2009). As researchers have examined what it takes to provide high quality PD that results in the implementation of ESTs, it has become clear that training efforts alone will not result in practice change (Sheridan, Edwards, Marvin, & Knoche, 2009; Zaslow, 2009; Zaslow, Tout, Halle, Whittaker, & Lavelle, 2010). In a review of the research on implementation science, Fixsen et al. (2005) identified evidence concerning what does and does not work. Despite being the most widely applied tactics, dissemination and training alone or in conjunction are not enough to lead to effective implementation, and these findings suggest policy makers and organizations apply a different approach. There is evidence pointing to a longer-term, multilevel model that addresses practitioner selection; performance-based training, feedback, coaching, and evaluation; program evaluation and systems interventions; and administrative involvement in the process (Fixsen et al., 2005). Elements of behavioral skills training (i.e., instructions, modeling, role-play, and feedback) have shown promise when used to improve procedural fidelity (Barnett et al.,
Key to the success of PD efforts is the element of ongoing coaching or performance feedback: the long-term provision of support to teachers through behavioral modeling, practice, and affirmative and corrective feedback (Klinger, 2004).

Coaching is a promising PD method for supporting teachers in achieving high levels of procedural fidelity in the implementation, promotion, and evaluation of evidence-based interventions (Fox, Hemmeter, Snyder, Binder, & Clarke, 2011) through the sharing of knowledge and skills and reciprocity of collaborative support (Wilson et al., 2012). Coaching refers to individualization of performance feedback by another individual. Performance feedback has the strongest empirical backing of any strategy used to promote procedural fidelity in educational settings (Hagermoser Sanetti & Kratochwill, 2009). It typically involves review of graphical displays of performance with affirmative and corrective written or vocal feedback. Meta-analyses examining the effective components of PD provide evidence that in addition to high quality training that incorporates effective elements of adult education (e.g., classroom-based modeling, practice, praise and corrective feedback), coaching that also includes these elements is fundamental to improving student outcomes and leads to the greatest and most sustained changes in practice (Joyce & Showers, 2002; Wade, 1985; Wing Institute, 2013). It is recommended that natural environments provide the setting for PD activities and that learning occurs collaboratively in teams and through relationships (Winton, 2000); a coaching model meets both of these criteria. The core elements of a coaching framework have been identified and the cycle involves planning goals and action steps, examining and supporting practice, and obtaining and reflecting on feedback about practice (Isner et al., 2011; Fox et al., 2011; Snyder et al., 2012).
Related Reviews and Current Paper

As procedural fidelity and coaching have increasingly become of interest to the research community, several reviews have been conducted on the topics. Kretlow and Bartholomew (2010) reviewed 13 studies published from 1989–2009. They applied a rigorous standard to the coaching studies included, excluding research that targeted ESTs lacking meta-analytic support. Although meta-analyses may offer the most convincing evidence, practices with emerging scientific support that closely match the context of the problem should not be disregarded (Detrich, Slocum, & Spencer, 2013). Further, although Kretlow and Bartholomew included the provision of performance feedback in their definition of coaching, they did not include performance feedback as a keyword in their electronic literature search. It may be argued that performance feedback and coaching share the same functional definition (i.e., they have the same effect on the environment; Cooper, Heron, & Heward, 2007); therefore, excluding performance feedback from the search may have resulted in the neglect of significant research findings.

Cavanaugh (2013) conducted a review of 25 studies on the effects of performance feedback on preK–12 general education and special education teachers’ use of empirically supported classroom management strategies. Results suggested that performance feedback was an effective strategy for increasing praise, but the results were less clear for teachers’ use of opportunities to respond. Cavanaugh’s inclusion of case study designs precludes conclusions regarding functional relations between the independent variable (i.e., performance feedback) and the dependent variable (i.e.,
teacher behavior) across studies and results specific to K-12 special education teachers are unknown.

Cornelius and Nagro (2014) reviewed eight studies on the use of performance feedback specifically with pre-service teachers to improve their teaching behaviors. The authors concluded that performance feedback is an EST for improving procedural fidelity. In another related review, Noell and colleagues (2014) conducted a meta-analysis of 29 peer-reviewed journal articles that analyzed intervention implementation and methods for improving fidelity. Results indicated that intervention implementation fidelity was initially low, but improved with performance feedback, self-monitoring, and environmental supports. The findings also suggested that follow-up support without data review was ineffective. Although the results of both Cornelius and Nagro and Noell et al. support the use of performance feedback, the term coaching was not included in the keyword searches of these reviews. It is possible that more studies could have been identified that would have strengthened the authors’ conclusions. Further, Noell et al. did not isolate the effects of coaching and performance feedback on K–12 special education teachers’ behavior.

The purpose of the present paper was to extend the literature by providing a comprehensive review of the empirical research on the use of coaching and performance feedback to improve procedural fidelity of pre-service and in-service teachers, specifically those working with students with special needs in K–12 settings. For this review, coaching was defined as the provision of performance feedback to a teacher based on data collected on measurable behaviors during direct observations, and it included various models (e.g., side-by-side coaching, consultative feedback, peer
coaching, and immediate feedback). Specific to K–12 special education teachers, the following research questions were addressed:

I. Where and with whom has coaching been effective?

II. What are the common characteristics and elements of coaching?

III. What teacher behaviors are being coached and what student behaviors are the teacher behaviors intended to impact?

IV. What is the impact of coaching on teacher and student behavior?

Method

Literature search procedures. A comprehensive search for articles to be included in this review was conducted using four steps. First, an electronic search of online databases including Academic Search Complete, Academic Search Premier, Education Research Complete, Education Full Text (HW Wilson), ERIC, MasterFILE Premier, PsycINFO, and Psychology and Behavioral Sciences Collection was conducted. Search terms included various combinations of the following keywords: coaching, performance feedback, procedural fidelity, treatment integrity, procedural integrity, special education, intervention, evidence based practice, and implementation. No dates were specified in the searches in an attempt to gather all relevant literature on the topic of interest. Second, to locate the most recent studies (2013–2014), hand searches of the following journals were conducted: Behavior Analysis in Practice, Exceptional Children, Education and Treatment of Children, Journal of Behavioral Education, Journal of Special Education, Journal of Applied Behavior Analysis, Remedial and Special Education, and Teacher Education and Special Education. Additionally, these journals’ websites were searched for online first articles. Third, the reference lists of articles
compiled were reviewed, and additional studies were identified and retrieved. Fourth, the reference lists of previous literature reviews (Cavanaugh, 2013; Cornelius & Nagro, 2014; Kretlow & Bartholomew, 2010; Noell et al., 2014; Hagermoser Sanetti & Kratochwill, 2009; Solomon, Klein, & Politylo, 2012) were reviewed, and any studies that may have been overlooked in the electronic and hand searches were identified and retrieved.

Selection of studies. The purpose of this review was to examine strategies effective in enhancing teacher implementation of specific skills and strategies; therefore, only studies that employed single-subject designs to show a functional relation between performance feedback or coaching on individual teacher behaviors were included. Studies that used quasi-experimental designs were not included because they did not permit conclusions to be made regarding individual teacher behavior. Similarly, group designs were not included because the researcher was interested in the effects of coaching on each individual teacher’s behavior and these results could not be disaggregated from the group data which only represent average effects of an intervention and may obscure variability within the group. Despite producing statistically significant effects, there may be individual non-responders within the group and some participants’ performance may actually worsen. In order to determine the effects of an intervention on behavior, behavior of individuals must be analyzed; group data may obscure the real effects of an intervention (Johnston & Pennypacker, 2009). Case studies, descriptive studies, AB designs, and studies that did not include baseline data were not included because they did not allow for the identification of functional relations. Additionally, only articles published in English in peer-reviewed journals were included in this review. It is possible
that unpublished theses or dissertations were thereby neglected; however, limiting inclusion to studies that had undergone a peer-review process strengthened conclusions made regarding functional relations between independent and dependent variables.

Once articles were identified, they were further screened to determine whether they met the following additional criteria: (a) at least one participant was a special educator or a teacher of students receiving special education services (e.g., teacher in inclusion classroom, teacher working with students with individualized education programs (IEPs) but not yet certified in special education; (b) at least one pre-service or in-service teacher participant was in a K–12 educational setting, and the effects of the intervention could be isolated for that individual; (c) performance feedback or coaching delivered by an external agent was reported as an independent variable separate from training (i.e., the effects of performance feedback or coaching could be disaggregated from initial training effects); (d) at least one dependent variable was observable and measurable teacher behavior (i.e., academic or behavioral assessment or intervention procedure); and (e) the teacher behavior was observed and measured in a classroom setting with students during normal school hours.

Studies that did not meet all of these criteria were excluded from this review. For example, studies were excluded if they only included general education teachers not working with students with special needs, prekindergarten teachers, or paraprofessionals as participants, or if these participants’ results could not be disaggregated from the target participants’ (i.e., K–12 teachers working with students with disabilities) data (e.g., Kelleher, Riley-Tillman, & Power, 2008; Kretlow, Cooke, & Wood, 2012; Kretlow, Wood, & Cooke, 2011; Scheeler, McAfee, Ruhl, & Lee, 2006; Wilczenski, Sulzer-
Azaroff, Feldman, & Fajardo, 1987). Although included in Cornelius and Nagro’s 2014 review of the use of performance feedback with pre-service special education teachers, Auld, Belfiore, and Scheeler (2010) was excluded from this study; because the research was conducted in general education classrooms, and there was no mention of students with disabilities in the description of research participants. In order to meet inclusion criteria, the teacher or setting had to be identified as special education, or at least one student with whom the teacher worked must have been reported as having a disability or IEP. Studies that utilized repeated measures analysis of variance or pre post measures were not included in this review (e.g., Lignugaris-Kraft & Marchand-Martella, 1993; Stitcher, Lewis, Richter, Johnson, & Bradley, 2006). Kalis, Vannest, and Parker (2007) reported use of an ABA design; however, a closer review of the method indicated that an AB design with maintenance data had been used. Therefore, conclusions regarding a functional relation between the independent and dependent variables could not be made, and the article was excluded. Studies that employed self-evaluation as the independent variable (e.g., Keller, Brady, & Taylor, 2005) were excluded, because self-monitoring procedures were not included in this review’s definition of coaching and performance feedback. Studies that reported data across dyads or groups of teachers (e.g., Hagermoser Sanetti, Luiselli, & Handler, 2007; Ploessl & Rock, 2014) were excluded, because the purpose of this review was to isolate intervention effectiveness on individual teacher behavior. Studies that were conducted in virtual reality classrooms and after-school tutoring programs were not included in this review (Garland, Vasquez III, & Pearl, 2012; Mallette, Maheady, & Harper, 1999).

Data Analysis
All of the studies that were identified for inclusion were coded and summarized in order to facilitate trend analyses of the commonalities and differences in study characteristics. Study characteristic categories included participants and settings; independent variables; and dependent variables and outcomes. Not all studies provided all of the information about all study characteristics. In all cases, studies were coded according to the data available in the articles.

Participants and settings. Information about the special education teachers who participated in the studies was coded. Gender, ethnicity, age, status (pre-service or in-service), number of years of experience, certification status, and participation in the study (voluntary or required by an administrator or supervisor) was coded for each teacher. Settings were coded for each study as elementary, middle, or high school (or some combination); number of schools and classrooms per study; and type of setting. Student characteristics including age, grade level, disability, gender, and ethnicity were coded.

Independent variables. Information about the coaches and coaching procedures in the studies was coded. Coach characteristics included role, qualifications, and experience. Pre-coaching initial training or pretest procedures that were conducted prior to the formal onset of coaching were coded for characteristics including type, number, duration, and content. Studies were then coded for coaching characteristics including duration, format, and frequency of coaching sessions.

Dependent variables and outcomes. The type of single-subject research design was coded for each article along with information related to the targeted teacher behaviors (i.e., type and dimension of behavior measured, performance criteria, and outcomes) as well as the targeted student behaviors and outcomes. Whether and how
generalization and maintenance data were collected was also coded for each study, in addition to measures of social validity.

Reliability

The first author and a graduate student working towards her master’s degree in applied behavior analysis independently coded 33.3% of the experiments included in this review. After reaching a training criterion of at least 95% agreement with the first author on three consecutive independently coded experiments, the graduate student applied the coding procedures to randomly selected studies. The point-by-point method was used by the first author to calculate intercoder reliability by dividing the number of agreements for each item on the coding sheet by the total number of items coded for each experiment and multiplying by 100 to yield a percentage of agreement. Intercoder reliability averaged 96.8% (range, 92.6% – 100%) across experiments.

Results

Twenty-four experiments reported across 23 articles met selection and inclusion criteria for this review. The majority (26%) were reported in the Journal of Applied Behavior Analysis, followed by Teacher Education and Special Education (17%). See Appendix A for a list of all journals represented in this review.

Participants and settings. Special education teachers with varying backgrounds and levels of experience, located in a wide range of settings, and working with diverse student populations were participants in this review of coaching research. See Appendix A for a summary of teacher and student participant characteristics and research settings.

Special educators. Seventy special education teachers participated across the 24 experiments reviewed. Of those experiments, six studies accounted for all 20 pre-service
teacher participants, and 18 studies (71%) involved in-service teachers ($n=50$). Six pre-service teachers were graduate students with 0–2 years of teaching experience, and 14 were undergraduate students with minimal to no experience. There were 16 male and 54 female participants, and in the nine studies that reported age, participants ranged from 21–54 years old. Of the eight experiments that reported race, seven included white teachers, accounting for 13 of the 21 participants whose race was reported.

Of the 20 pre-service teachers, eight volunteered to participate (Capizzi, Wehby, & Sandmel, 2010; Scheeler, Bruno, Grubb, & Seavey, 2009), and the other 12 were referred due to low performance (Morgan, Gustafson, Hudson, & Salzberg, 1992; Morgan, Menlove, Salzberg, & Hudson, 1994) or low ratios of positive to negative interactions with students (Rathel, Drasgow, & Christle, 2008). Whether participation was voluntary was reported for 26 of the 50 in-service teachers, and it was for 23 participants (DiGennaro-Reed, Coddington, Catania, & Maguire, 2010; DiGennaro, Martens, & Kleinmann, 2007; DiGennaro, Martens, & McIntyre, 2005; Hawkins & Heftin, 2011; Hundert, 1982; Myers, Simonsen, & Sugai, 2011; Sterling-Turner, Watson, & Moore, 2002; Vuran & Olcay Gul, 2012). Three in-service teachers were referred by their clinical director due to a perceived potential to benefit from classroom management training (Simonsen, Myers, & DeLuca, 2010).

Myers and colleagues (2011) recruited teachers with reported high levels of problem behavior in their classrooms through a self-nomination process. From this pool, the researchers identified “non-responders” within a response to intervention (RTI) framework. Despite exposure to the primary intervention tier (i.e., training in school-wide positive behavior support), these teachers were observed to deliver high rates of
reprimands and low rates of praise statements. Therefore, they were confirmed to be nonresponsive to the first tier of intervention, and they volunteered to participate in the study in order to gain more intensive support.

**Settings.** Fifteen studies reported whether the teachers were located in elementary, middle, or high school settings. Several studies included more than one school site, and a total of 15 elementary schools, six middle schools, and five high schools were identified. Thirty-eight percent of the studies were conducted in special education, alternative, or vocational schools. A total of 48 classroom settings were reported across 23 of the experiments, and setting(s) was not reported in one study. The majority of these settings (n=31) were special education classrooms. Eleven resource rooms where small group instruction or “pull out” took place and six classrooms identified as inclusion or general education settings were reported.

**Students.** Nineteen studies reported the number of students with whom the teachers implemented interventions for a total of 220 student recipients of teacher intervention implementation. In the 14 studies that reported students’ ages, students ranged from 5 to 21 years old. Grade levels ranging from kindergarten through ninth were represented across the 10 studies that specified grade level. A wide range of student disabilities was reported across 19 experiments (e.g., autism, learning disabilities, brain injuries, emotional or behavioral disorders, attention deficit hyperactivity disorder, mild to moderate intellectual disabilities or mental retardation), and five studies did not specify student disabilities. In the 13 studies that reported student gender, there were 70 males and 38 females. Six studies reported student race or ethnicity, totaling 42 African Americans, 25 Caucasians, 21 Hispanics, and one Native American.
**Independent variables.** In Appendix A, the articles included in this review are grouped according by the individuals who served as the coaches and the independent variables are summarized in terms of initial training and coaching procedures.

**Coaches.** Coaching was provided by individuals with varying qualifications and levels of experience. In the majority of experiments (n=17), the coach was identified as the researcher, experimenter, or first author. Coach characteristics were provided for nine studies, and doctoral students were coaches in three (Capizzi et al., 2010; Digennaro et al., 2005; Sterling-Turner et al., 2000). Two studies noted that experimenters serving as coaches held doctoral degrees and advanced experience in educational consulting or behavior analysis (Pence et al., 2014; Vuran & Olcay Gul, 2012). The experimenter-coach in Codding et al. (2008) was described as having three years of experience working in the school prior to the study. Although the coach in Simonsen et al. (2010) was a master’s student who also served as the data collector, initial teacher training was conducted by a university professor and a doctoral student, and the initial performance feedback meeting was conducted by the professor and both graduate students. The studies involving undergraduate peer coaches provided detailed descriptions concerning the coaches’ background experiences and qualifications (Morgan et al., 1992; Morgan et al., 1994).

Pence and colleagues (2014) taught six female teachers to serve as trainers in functional analysis methodology for the teacher-trainees during the initial phases of the study. These teacher-trainers ranged in age, from 23–54 years old, and in experience, from 1–25 years. Although not certified at the time, all were enrolled in a course sequence designed to result in eligibility to sit for the exam to become Board Certified
Behavior Analysts (BCBAs). Because all teacher-trainers were employed full-time in the public school system, the teacher-trainees’ practicum supervisor, a BCBA with several years of experience conducting functional analyses, served as the coach observing classroom implementation and providing performance feedback.

**Pre-Coaching.** A few studies described the initial training of the coach on the topic of conducting observations and objective evaluations, and providing performance feedback (Capizzi et al., 2010; Morgan et al., 1992; Morgan et al., 1994). Pence et al. (2014) utilized pyramidal training to equip a small group of teachers with skills to conduct functional analysis and behavioral skills training procedures (BST). Those teachers subsequently used BST with other teachers who ultimately implemented the procedures with students in their classrooms and received coaching support.

All studies began with an initial training or coaching session conducted either prior to baseline or intervention, or at the onset of intervention. Several trainings provided general overviews of topics such as functional behavioral assessment (Bethune & Wood, 2013), applied behavior analysis (Codding et al., 2005), and SWPBS (Myers, 2011), and others described more specific procedures in detail, such as the steps in an individual behavior plan (e.g., Codding et al., 2005; DiGennaro et al., 2007; Minor, Dubard, & Luiselli, 2014).

Initial training sessions ranged in duration from one 30-min meeting (Simonsen et al., 2010) to two 4-hr sessions. Training sessions incorporated combinations of instructional strategies such as written and vocal instructions (Minor et al., 2014; Simonsen et al., 2010), written instructions and practice with vocal feedback (Hundert, 1982), and written instructions with vocal explanations for challenging content (Vuran &
Olcay Gul, 2012). Both of the peer coaching studies included in this review indicated that the student teachers attended practicum seminars and were exposed to written and vocal instructions and modeling (Morgan et al., 1992; Morgan et al., 1994). In addition to written and vocal instructions, modeling and role-play with feedback were part of training procedures for several studies (Codding et al., 2008; Moore et al., 2002; Pence et al., 2014). Other researchers added to the initial training teacher selection of self-management strategies (Simonsen et al., 2010) or goal-setting (Duchaine et al., 2011) in an effort to arrange antecedent conditions that would prompt the teacher to engage in target behaviors.

In-situ coaching was incorporated into the training procedures of several studies. For example, Codding et al. (2005) provided an initial basic training for teachers followed by two-weeks of intensive training on individual behavior plans with modeling, practice, and immediate feedback in their classrooms. Similarly, didactic instruction and modeling were supplemented in two studies with in-situ coaching until teachers achieved 100% procedural fidelity on two consecutive sessions (DiGennaro et al., 2005; DiGennaro et al., 2007).

During initial coaching meetings, Myers et al. (1997) and Sterling-Turner et al. (2002) utilized versions of the Problem Identification Interview (Bergan & Kratochwill, 1990). Several studies incorporated a combination of data review with goal-setting (Martens et al., 1997; Sutherland et al., 2000), video feedback (Hawkins & Heflin, 2011), troubleshooting (Morgan et al., 1992), or written and vocal instructions (Rathel et al., 2008) in the initial coaching session.
Ten studies reported standardized performance criteria for the termination of training conditions or the transition to subsequent experimental conditions. Student teachers in Morgan et al. (1992) were required to pass a pretest prior to practicum placement (Morgan et al., 1992). Morgan and colleagues (1994) required peer coaches to reach an agreement criterion of 80% on the identification of targeted teaching behaviors from videotapes. Following a 60-min training that included written and vocal instructions, teachers took a 5-item written posttest and received corrective feedback before beginning baseline (DiGennaro-Reed et al., 2010).

In some studies, teachers were exposed to feedback that was provided in a manner different from the intervention procedures or unrelated to the target behaviors. For example, in both of the experiments conducted by Scheeler et al. (2009), delayed feedback was provided during baseline; during intervention, teachers received immediate feedback via BIE devices. In Codding et al. (2005) ongoing informal feedback was provided daily by classroom consultants, but it was not specific to plan implementation (i.e., target teacher behaviors). Similarly, Codding et al. (2008) recognized an element of unrelated, ongoing weekly consultation.

**Coaching.** Coaching procedures varied along a continuum of support ranging from written feedback to face-to-face debriefings, meetings with performance feedback facilitated by review of videotapes, and in-situ coaching during classroom implementation. Martens and colleagues (1997) provided a written note at the beginning of each subsequent observation with feedback on the teacher’s performance during the prior session. In several studies, coaches met in person with teacher participants to provide feedback. The post-observation timing and duration of coach debriefs varied.
Coaching sessions commonly occurred immediately after, within 5–10 min, or on the same day of the observation and ranged in duration from less than 2–20 min (Codding et al., 2005; Codding et al., 2008; Pence et al., 2014). In addition to a debrief meeting conducted immediately post-observation, the coach in Sutherland et al. (2000) met briefly with the teacher prior to each observation to provide a reminder and an example of how to use behavior specific praise. Hundert (1982) provided coaching following the first two post-training observations, and Sterling-Turner et al. (2002) offered just one coaching session post-training.

In one study, participants chose their preferred mode of daily coaching. Simonsen and colleagues (2010) gave teachers the option of written feedback left in their mailboxes, brief vocal feedback, or email feedback. Two teachers opted to receive feedback from the data collector in the morning prior to the next observation, and one teacher chose to receive an afternoon email with a summary of performance from that day. In addition, all teachers were provided with updated graphs with written feedback from the data collector daily.

Duchaine et al. (2011) also incorporated a combination of coaching formats: daily written feedback was left in a folder on the teacher’s desk after each observation and a 5-min coaching conference was conducted prior to every third observation. Similarly, Rathel et al. (2008) coached pre-service teachers using a combination of written feedback delivered daily via email and weekly face-to-face meetings with the experimenter and university supervisor.

A handful of studies incorporated videotape into coaching procedures. Pre-service teachers in Capizzi et al. (2010) videotaped their lesson delivery, and they reviewed the
videotapes during weekly coaching sessions with their university supervisor. Morgan and colleagues (1994) also used videotapes of performance with pre-service teachers. During each coaching session, the student teacher and peer coach each completed an evaluation form while viewing a randomly selected recent videotape, then they compared scores (Morgan et al., 1994).

During pre-observation meetings, the coach in Hawkins and Heflin (2011) used videotapes to highlight instances where the teachers had used behavior specific praise statements. Similarly, DiGennaro-Reed et al. (2010) employed individualized video modeling pre-observation, having the teacher view a 4–6 min video of a model demonstrating the procedures with voiceover and on-screen text to highlight critical features. In the coaching condition, performance feedback was provided vocally prior to viewing the videotape. Then, while viewing the videotape, the coach paused at relevant points to indicate where errors had been made during the observation and to focus attention on how to accurately implement those particular steps. Alternatively, during post-observation meetings, Vuran and Olcay Gul (2012) used a combination of self-modeling and in vivo modeling. The researchers compiled videotapes of the teachers’ accurate implementation of discrete trial teaching procedures and viewed them with the teachers. Then, the experimenters conducted in vivo modeling, demonstrating the procedures in role play for the teachers. After viewing both models, the teachers were asked to identify errors and offer corrective feedback.

In-situ coaching was provided in several studies. In Bethune and Wood (2013), the coach met briefly with the teacher pre-observation to provide instructions, and then provided an initial model and immediate feedback during the 10-min observation. Post-
observation, the coach quickly reviewed the teacher’s performance, highlighting steps that were implemented accurately. Corrective feedback was provided to teachers during observations in Minor et al. (2014), followed by 5-min debriefs with praise for steps implemented accurately 30 min after observations. In addition to in-situ and post-observation performance feedback, the researchers introduced problem solving consultation (PSC) that involved data review, discussion of barriers to implementation, and troubleshooting (Minor et al., 2014). Morgan and colleagues (1992) also provided in-situ coaching via affirmative and corrective gestural and vocal feedback during observations. Using a bug-in-ear (BIE) device, in-situ coaching was provided in both of the experiments conducted by Scheeler et al. (2009).

Ten studies included objective performance criteria for termination of coaching or fading into maintenance conditions. An accuracy or fidelity criterion of 90% was commonly applied, across an unspecified number of sessions (Pence et al., 2014), two consecutive sessions (Bethune & Wood, 2013), and three consecutive sessions (Scheeler et al., 2009). Hawkins and Heflin (2011) set an individual criterion for each teacher, based on mean baseline performance, and participants reached mastery upon achieving their individual criteria for three consecutive sessions across a minimum of five sessions. Vuran and Olcay Gul (2012) required teachers achieve 95% accuracy for the termination of in-vivo and video self-modeling.

DiGennaro and colleagues (2005) applied a criterion of 100% fidelity for teachers to avoid a coaching meeting that involved directed rehearsal of steps implemented incorrectly. If the teacher achieved the criterion, he or she did not have to meet with the consultant the following day and was only provided with the daily written feedback left
in his or her school mailbox following each observation. In addition, the researchers utilized a thinning schedule to fade the coaching procedures (i.e., performance feedback and negative reinforcement). Contingent on maintaining 100% fidelity across three consecutive sessions, coaching occurred every other session, then once weekly, and finally once every two weeks. Similar negative reinforcement contingencies and dynamic fading procedures were applied in DiGennaro et al. (2007).

Using an RTI framework, Myers et al. (2011) varied the levels of coaching support across secondary and tertiary tiers of intervention dependent upon teachers’ achievement of two performance criteria. For three consecutive sessions, the teacher was required to (a) deliver at least six behavior specific praise statements, and (b) maintain a ratio of 4:1 positive to negative interactions with students. Following baseline (Tier 1), teachers were introduced to Tier 2 intervention that involved weekly meetings with the experimenter to receive performance feedback. If the teacher had met both criteria, she would move to maintenance. If the teacher only met one criterion, she remained in Tier 2. Contingent on failure to meet either criterion, the teacher moved into Tier 3 that consisted of daily written feedback delivered via email and in person 2–5 min coaching sessions the following day. Once in Tier 3, the teacher moved back to Tier 2 contingent upon meeting both criteria for three consecutive sessions, or she remained in Tier 3 if only one criterion had been met. Tier 3 would have been further individualized to include reinforcers, retraining, and modeling if the teacher had remained nonresponsive to intervention, but this was not necessary.

Dependent variables and outcomes. Appendix A presents a summary of the articles’ designs, dependent variables, and outcomes. In order to experimentally evaluate
the effects of coaching, a majority of studies \( n=21 \) employed multiple baseline designs across teachers or teacher-student dyads. One experiment embedded an alternating treatments design within a multiple baseline across teachers design (Codding et al., 2008), and one embedded a reversal design within a multiple baseline across teachers design (Hawkins & Heflin, 2011). One study utilized a reversal design to demonstrate a functional relation between coaching and teacher fidelity (Sutherland et al., 2000).

**Teacher Behaviors.** Seventeen studies measured teacher accuracy, integrity, or fidelity with procedures, steps, or skills. Of these, targets included the implementation of individualized behavior plans (e.g., Bethune & Wood, 2013; Codding et al., 2005; DiGennaro et al., 2007); instructional trials, lesson components, or discrete trial teaching trials (e.g., Capizzi et al., 2010; Scheeler et al., 2009); class-wide behavior plans (Codding et al., 2008); and functional analysis conditions (Moore et al., 2002; Pence et al., 2014). Ten experiments measured the rate of teacher behaviors including opportunities to respond, non-behavior specific praise, behavior specific praise, effective instructional behaviors, or prompts (e.g., Duchaine et al., 2011; Hawkins & Heflin, 2011; Martens et al., 1997; Rathel et al., 2008). Simonsen et al., 2010 reported percentage of intervals with behavior specific praise and non-behavior specific praise, measured using partial interval recording procedures. In addition, two studies measured the ratio of positive to negative interactions between teachers and students (Myers et al., 2011; Rathel et al., 2008).

All of the studies demonstrated that coaching led to improvements in at least one teacher behavior as evidenced by an increase in trend or level, or a decrease in variability. All 44 teachers who were coached on fidelity measures improved performance. Coaching
increased the rate of opportunities to respond for two of three teachers (Capizzi et al., 2010), three of five teachers (Morgan et al., 1994), and three of three teachers (Simonsen et al., 2010). With coaching, all teachers increased rates of targeted skills including behavior-specific praise for 20 teachers, praise (not defined as behavior specific or non-behavior specific praise) for three teachers, prompts for three teachers, and instruction for 10 teachers. Rates of non-behavior specific praise increased for nine of 11 teachers.

**Student behaviors.** Fourteen studies identified the student behaviors that the teachers’ behaviors were intended to address. Five targeted only appropriate student behaviors such as academic responding or engagement, on-task behaviors, mastery of lessons, or functional communication (Duchaine et al., 2011; Martens et al., 1997; Morgan et al., 1994; Sutherland et al., 2000; Vuran & Olcay Gul, 2012). Five studies addressed only problematic student behaviors such as tantrums, work refusal, self-injurious behavior, or aggression (Codding et al., 2005; DiGennaro et al., 2007; Digennaro et al., 2005; Hawkins & Heflin, 2011; Minor et al., 2014). Four studies targeted a combination of appropriate and problematic student behaviors (Bethune & Wood, 2013; Hundert, 1982; Myers et al., 2011; Sterling-Turner et al., 2002).

Of the 14 studies that identified targeted student behaviors, 12 reported student outcomes. In the two studies that targeted only problem behavior and reported outcomes, decreases were seen in all students (DiGennaro et al., 2007; DiGennaro et al., 2005). Four of the studies that targeted only appropriate behavior found increases across students (Martens et al., 1997; Morgan et al., 1994; Sutherland et al., 2000; Vuran & Olcay Gul, 2012). One study that targeted only appropriate student behavior reported inconclusive results: Decreases in appropriate behavior were observed in two students, and there was a
slight increase for one (Duchaine et al., 2011). In the studies that reported outcomes regarding both appropriate and problem student behaviors, desirable effects were achieved for all students (Bethune & Wood, 2013; Hundert, 1982; Myers et al., 2011; Sterling-Turner et al., 2002).

Only two studies deliberately examined the relation between teacher fidelity and student outcomes. Using correlational analyses, significant correlations were found for three of four teacher-student dyads (DiGennaro et al., 2007) and two of four teacher-student dyads (DiGennaro et al., 2005). It should be noted that in both of these experiments, all teachers achieved a mastery criterion of 100% fidelity for three consecutive sessions.

**External and social validity.** Few studies reported maintenance or generalization data on teacher or student behaviors. In Bethune and Wood (2013), all teachers generalized skills to a different activity with target student. No other studies reported generalization of teacher skills, and no studies reported generalization of student behavior improvements. Maintenance data were reported slightly more frequently across studies. For example, Bethune and Wood found 100% accuracy during maintenance probes up to 18 days following coaching. In maintenance checks ranging from one to 15 weeks post-coaching, all teachers maintained high rates of fidelity (Codding, 2005). Although DiGennaro et al. (2005) did not intentionally collect maintenance data, their dynamic fading procedures indicated that results maintained in the absence of intervention (DiGennaro et al., 2005). DiGennaro-Reed (2010) collected maintenance data 1-week following termination of individualized video modeling with performance feedback and found that results maintained at 100% fidelity across participants. Hawkins and Heflin
(2011) found that one of three teachers continued to deliver behavior specific praise when intervention was withdrawn 10 school days post-intervention. Myers and colleagues (2011) collected maintenance data on two of four teachers and found that praise rates were lower or similar to pre-intervention or baseline rates across both teachers. Vuran and Olcay Gul (2012) reported that 4–8 weeks post-intervention, teachers maintained 98–100% fidelity with acquired skills. In the first experiment reported by Scheeler et al. (2009), pre-service teachers tape-recorded their delivery of direct instruction lessons, and results indicated that performance maintained at criterion levels but deteriorated from practicum assessments to student teaching observations. In the second experiment, results maintained for 2–6 week follow-up sessions (Scheeler et al., 2009).

Generalization and maintenance data were even more infrequently reported on student behaviors. Duchaine et al. (2011) showed that on-task behavior of two of three students declined in maintenance conditions. Bethune and Wood (2013) found that decreases in all problem behaviors and increases in all but one replacement behavior maintained post-intervention. When the coaching intervention was withdrawn in Duchaine et al., there was a return to baseline for both the students for whom data were collected. Myers and colleagues (2011) reported that decreases in student problem behaviors maintained for both teachers.

**Discussion**

The purpose of this review was to summarize studies that examined the effects of coaching on improvements in pre-service and in-service K-12 special education teachers’ implementation fidelity. Twenty-four peer-reviewed experiments met inclusion criteria and were included. The *Journal of Applied Behavior Analysis* accounted for the majority
of peer-reviewed articles, suggesting that behavior analysts have begun to recognize the significance of supporting natural interventionists to achieve procedural fidelity in applied settings. Proactively promoting fidelity is a step beyond the call for ensuring the integrity of the independent variable (Peterson, Homer, & Wonderlich, 1982), and it is encouraging that researchers are pursuing such a critical piece of implementation science. Further, the results of this review corroborate findings of others suggesting that coaching is a viable PD model for improving teachers’ procedural fidelity (Cornelius & Nagro, 2014; Kretlow & Bartholomew, 2012; Noell et al., 2014). Positive findings were noted across a wide range of settings with a diverse student population ranging broadly in age and ability level.

This review differed from the 2010 review conducted by Kretlow and Bartholomew with the inclusion of an additional four years of research and a broader definition of research-based interventions. Additionally, the current study included performance feedback as a keyword in the electronic search and narrowed the participant pool to K–12 special education teachers. Of the 24 studies included in the current review, one from the Kretlow and Bartholomew review was included; the others were excluded because they did not use single-subject research designs or were conducted in general education, preschool, or tutoring settings.

The current review narrowed the scope of Cavanaugh’s 2013 review by including only K–12 special education teachers. It also differed with the inclusion of studies targeting teachers’ use of instructional strategies in addition to behavior management techniques. Seventeen of the articles included in the present review were also included in Cavanaugh’s review. Three of the 24 studies included in this review were included in a
2014 review of eight studies by Cornelius and Nagro. The current review also differed from Cornelius and Nagro’s and from the one conducted by Noell and colleagues (2014) because the term coaching was included in the search. Eighteen of the studies included in the present review were not included in the 29 article meta-analysis by Noell et al. In addition to reviewing additional articles, the present paper contributes to the literature by providing implications for those interested in the use of coaching specifically with K–12 special education teachers.

**Implications**

The present review extends the literature with regard to implications for research and practice in ways that can be framed around its answers to the research questions.

**Where and who?** Half of the participants in the 24 experiments included in this review were preservice special education teachers, 60% of whom were referred to participate to address low performance. Presumably, participants who receive coaching voluntarily would respond better than those who receive it reluctantly, but the required recipients in the reviewed studies responded as well to the intervention as those who opted to participate. This finding suggests that school leaders and teacher educators may integrate coaching into practice and that teachers will benefit from being coached, voluntarily or not.

Results of this review and others (e.g., Cornelius & Nagro, 2014) highlight the importance of incorporating performance feedback and coaching into special education teacher preparation and PD programs. Teacher educators and administrators concerned with outcomes for students with disabilities would be wise to use coaching to improve teachers’ fidelity with ESTs. In fact, the use of performance feedback with preservice
special education teachers to improve implementation fidelity is an EST (Cornelius & Nagro, 2014).

**What?** As seen in other reviews (e.g., Cavanaugh, 2013; Kretlow & Bartholomew, 2010), critical components of coaching were identified in almost all of the studies including (a) an initial, highly interactive training or coaching session; (b) direct observations of performance in the classroom; and (c) data-based debrief with corrective and affirmative feedback. The procedures involved in behavioral skills training meet the criteria for interactive training and may effectively introduce a teacher to an instructional strategy. Then, a coach must watch the teacher implementing the strategy in the classroom and collect data on the accuracy of skill performance. A subsequent coaching debrief should include a review of the data with praise for steps implemented correctly and corrective feedback for incorrect steps.

Similar to Cavanaugh’s 2013 review, the majority of studies included in this review relied on experimenters, external consultants, or university-based student teacher supervisors. After the research has been conducted, the problem has been solved, or the student teaching practicum has been completed, there is no one left to continue providing coaching. Given that EBP is a recursive problem-solving process, coaching would likely be most beneficial if it too were ongoing. The coaches in two studies (Morgan et al., 1992; Morgan et al., 1994) were undergraduate peers. Peer coaching may offer a viable model that relies on “natural implementers.”

**Targets and Impact?** Consistent with the findings of Kretlow and Bartholomew (2010), the studies in this review overwhelming indicate that coaching improved teacher fidelity with a variety of behaviors. In particular, teachers who were coached improved
their use of praise statements and implementation of behavior plans. Similar to the findings of Cavanaugh (2013), the effect of coaching on teachers’ use of opportunities to respond was less clear (e.g., Capizzi et al., 2010; Morgan et al., 1994). It is possible that teachers find consequence interventions easier to implement than antecedent interventions. Perhaps discrete student behaviors function as clear antecedents for the teacher to implement consequences; discriminative stimuli cuing teacher responses prior to student behavior may be ambiguous. In regard to similar findings, Cavanaugh (2013) offered two alternative explanations. He suggested that delivering consequences may be more immediately and regularly reinforcing to teachers. Delivering opportunities to respond does not ensure that the desired student response will occur, whereas student compliance precedes and is strengthened by the use of praise. On the other hand, opportunities to respond are much more context dependent than praise that can be used broadly across diverse settings and students for a variety of behaviors. Oftentimes, opportunities to respond require a thorough understanding of the content and the students’ background knowledge, and phrasing complex questions may require more response effort than making praise statements.

Consistent with previous reviews (Kretlow & Bartholomew, 2010) there is a need for greater emphasis on student outcomes in the coaching literature. Half of the studies included in this review did not collect student outcome data. The purpose of special education is to improve outcomes for students with disabilities; in order to be relevant, coaching must contribute to this goal. Similarly, the extent to which results for teachers and students generalize and maintain over time is a neglected aspect in most of the coaching research. Researchers, teacher educators, and PD personnel who use coaching
should measure teacher and corresponding student behaviors across settings and time to ensure that intended effects are achieved and sustained.

Limitations

There are several limitations to this review that should be taken under consideration. First, the review was intended to provide a summary of the current literature employing single-subject designs, and a statistical analysis was not conducted of the results. Future literature reviews should attempt to quantify the extant single-subject experimental literature on coaching teachers to improve procedural fidelity. Second, narrowing the scope of the review to include only single-subject designs may have excluded empirically sound research (e.g., randomized control trial group designs). Future reviews may include all experimental literature demonstrating functional relations between coaching and procedural fidelity for special education teachers using ESTs. A third, similar limitation is the publication bias of article selection. It is possible that coaching research with special education teachers is and has been published in peer-reviewed journals other than those included in the present review. Additionally, unpublished theses or dissertations with experimental research may have contributed to the data analysis but were not included in this review. Fourth, due to the complexity and varying nature of coaching protocols direct comparisons between models is not feasible. Future research should attempt to more systematically extend variations of coaching procedures.

Conclusion

The evidence supporting the use of coaching to improve teachers’ performance of skills with fidelity in natural settings (Kretlow, Cooke, & Wood, 2012) suggests that
coaching may prove useful in supporting new teachers as they learn to engage in EBP as a problem-solving process. Further, some evidence indicates that teachers view coaching as an acceptable form of PD. For example, the results from a social validity survey administered to 44 special education teachers and teacher assistants by Strohmeier and colleagues (2014) revealed that the majority of participants rated performance feedback as the preferred method for improving procedural fidelity compared to avoidance (negative reinforcement) of supervision meetings, online training, and financial incentive. Specifically, participants rated performance feedback as the most likely method to be effective for improving procedural fidelity and as the method to which they would most likely be responsive. This evidence suggests that teachers may consider coaching to be a socially valid form of PD for improving procedural fidelity.

One valuable aspect of coaching is that it incorporates important features of adult learning. When teachers play an active role in their PD it enables them to reflectively implement practices, refining and adapting them as needed to match their unique classroom environments (Diamond & Powell, 2011). In the absence of feedback, neither teacher nor student performance is likely to improve (Daniels, 2013). Coaching is a way of shaping desirable teacher performance. Through the provision of differential reinforcement, coaches can shape new behaviors using a positive approach (Cooper, Heron, & Heward, 2007).

None of the research included in the current review examined the use of coaching to improve special education teachers’ procedural fidelity engaging in EBP as a problem-solving process. Given the need to develop problem-solving skills among novice special
education teachers, investigating the effects of coaching for this purpose may be a worthwhile endeavor.

**Purpose**

EBP is a recursive problem-solving process special education teachers can use to pinpoint academic and behavioral targets. Once identified, scientifically supported interventions can be selected, adapted, and implemented to address learners’ needs, and student data can be monitored to evaluate intervention efficacy. Problem solving is a chain of operant behaviors that can and should be explicitly taught to novice teachers so that they are prepared to effectively and efficiently improve student outcomes. The purpose of the current study was to extend the literature base by examining the use of coaching to improve novice special education teachers’ fidelity with the first three steps of the EBP process (i.e., pinpoint, select, and adapt), as evidenced in their adherence to an EBP action plan protocol. A second purpose was to examine teachers’ fidelity implementing their EBP action plans in their classrooms to address actual, teacher-identified problems. A third purpose was to evaluate the extent to which teachers reported satisfaction with the goals, outcomes, and procedures of the study.
Chapter 3: Method

This chapter describes the research method that was used in this study to answer the following research questions:

I. What are the effects of coaching on novice special education teachers’ fidelity with EBP action plans for simulated scenarios?

II. What are the effects of coaching on novice special education teachers’ fidelity with EBP action plans for actual scenarios?

III. To what extent do novice special education teachers implement their EBP action plans with fidelity in their classrooms to address actual scenarios?

IV. Are the goals, procedures, and outcomes of coaching on EBP as a problem-solving process considered to be socially valid by novice special education teachers?

Participants and Settings

Four special education teachers attending a large Midwestern university participated in this study. See Table 1 for a summary of participant characteristics. Sebastian and Marissa were preservice teachers enrolled in a mild-to-moderate disability intervention specialist undergraduate program, and they were completing their final student teaching practica during their participation in the study. Joy and Sophie were full-time inservice teachers; Joy taught in a public middle school and was enrolled in a Master’s program in applied behavior analysis (ABA), and Sophie taught in an inclusive
preschool program and was enrolled in a Master’s program in early childhood intervention. Joy was in her third year of teaching and held a Bachelor’s degree in special education with licensure as a mild-to-moderate intervention specialist. Sophie was also in her third year of teaching and held a Bachelor’s degree in early childhood education. Joy and Sophie were both receiving behavior analytic supervision as part of the independent fieldwork requirement to sit for the exam to become Board Certified Behavior Analysts (BCBAs®). All participants had been exposed to empirically validated interventions in their coursework and practical experience, but none had been explicitly trained or coached on engaging in EBP as a problem-solving process.

Table 1. Participant Characteristics

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Age</th>
<th>Ethnicity</th>
<th>GPA</th>
<th>Status</th>
<th>Current Program</th>
<th>Years of Classroom Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joy</td>
<td>F</td>
<td>26</td>
<td>Non-hispanic/White</td>
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<td>G</td>
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<tr>
<td>Sebastian</td>
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<td>3.92</td>
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<td>Mild/moderate</td>
<td>0</td>
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<td>Marissa</td>
<td>F</td>
<td>22</td>
<td>Non-hispanic/White</td>
<td>3.73</td>
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<td>Sophie</td>
<td>F</td>
<td>31</td>
<td>Non-hispanic/White</td>
<td>4.0</td>
<td>G</td>
<td>Early Childhood</td>
<td>3</td>
</tr>
</tbody>
</table>

1GPA = Grade point average
2UG = Undergraduate student; G = Graduate student
3ABA = Applied behavior analysis; Mild/moderate = mild-to-moderate intervention specialist; Early childhood = Early childhood intervention specialist

All baseline and coaching sessions were conducted one-on-one in the participants’ classrooms during a time when no students were present. Follow-up probes were conducted in participants’ classrooms during regularly occurring classroom instruction.

**Experimenter and Research Assistants**
The experimenter served as the trainer and coach for all participants. The experimenter was a doctoral candidate and BCBA® with nine years of experience working with teachers and children with disabilities in special education classroom settings. The experimenter was providing Joy and Sophie behavior analytic supervision during the time of the study, and she had been a teaching assistant for the ABA for Teachers course Sebastian and Marissa took during the prior school year. Two graduate students enrolled in an ABA Master’s program and one graduate student enrolled in an early childhood intervention specialist Master’s program served as data collectors and research assistants. They collected procedural fidelity data on the implementation of experimental conditions and interobserver agreement (IOA) data on participants’ fidelity with writing EBP action plans. In addition, they assisted with the identification of essential components of the ESTs selected in participants’ EBP action plans.

**Instructional Design and Materials**

**Simulated scenarios.** The experimenter developed 15 simulated scenarios containing information regarding academic and behavioral problems, response to intervention (RTI) tiers, and student ages or grade levels (Appendix B). Prior to beginning the study, the experimenter informally interviewed teachers with classroom experience who were not participating in the study to gather information that was subsequently used in creating the simulated scenarios. Characteristics including grade level (i.e., elementary, middle, or high school), RTI tier (1, 2, or 3), and problem (academic or behavioral) were balanced across the scenarios in an attempt to “teach the full-range of relevant stimulus conditions and response requirements” (Cooper, Heron, & Heward, 2007, p. 626) and promote generalized behavior change. Simulated scenarios
were randomized across participants, and participants were never exposed to a scenario more than once. That is, every simulated scenario presented to a participant was novel to that participant.

**EBP action plan.** The experimenter designed a template to facilitate the participants’ successful completion of the first three steps of the problem-solving process (i.e., pinpoint, select, adapt; Appendix C). **Pinpoint,** the first section of the plan, required the participant to identify the students, age or grade level, disability, area of student need, RTI tier, setting, and other students or staff, if applicable. **Select,** the second section of the plan, required participants to identify an EST to address the identified problem, to specify the source used to locate the practice, and to provide a rationale for selecting it. In the third section of the plan, **Adapt,** participants listed the materials required to implement the selected practice. If an initial training procedure was necessary to introduce the students or paraprofessionals to the practice, there was space provided for the participants to write the training steps. Then, the participants listed the implementation steps for the regular use of the practice and the data collection procedures for monitoring student baseline performance and response to intervention. The experimenter created a task analysis of the instructions for completing the EBP action plan (Appendix D) and included it as part of the EBP coaching manual.

**EBP coding form.** The experimenter designed a rubric to evaluate the participants’ fidelity with completing the EBP action plan (see Appendix E). The coding form contained a total of 17 items related to the three sections of the EBP action plan.

**EST sources list and task analyses.** The experimenter created a list of the approved sources for identifying ESTs identified in Torres, Farley, and Cook (2012).
This list was used as a guide for participants in selecting interventions. The list includes the websites along with summaries of the populations of students targeted and academic and behavioral domains addressed (Appendix F). Further, a task analysis listing the steps to navigate the website in order to locate ESTs and implementation checklists (if available) was created for each source (see Appendix G). Additionally, a task analysis of the steps to locate an original article referenced by a source was created to facilitate the identification of procedures in the event that a source lacked sufficient detail for the participant to create an EBP action plan.

**EST essential component checklists.** Researchers have suggested the importance of including the essential components when adapting an EST for classroom implementation (Torres et al., 2012). If the participant indicated that an approved source (i.e., website) provided sufficient information from which to adapt the EST procedures, the extent to which the essential components were included was evaluated by cross-referencing the EBP action plan with the website. In the event that a participant specified an original article as an additional source that he or she used to identify the procedures of on EST, the experimenter and research assistants created checklists outlining the critical features as specified in the article. The experimenter located the original article the teacher cited on the EBP action plan. The experimenter then sent a research assistant the article with a checklist template for listing the article title, indicating whether an initial training procedure was necessary, and listing the EST’s essential components for implementation. The experimenter and research assistant independently consulted the method and procedures described in the article and listed the key features. Together, they then reached consensus on the essential components, and that checklist was used to
evaluate whether the participant had included the key features of a given practice in his or her EBP action plan.

**EBP coaching manual.** During the initial coaching session, participants were provided with an EBP coaching manual that included a brief rationale for engaging in EBP as a problem-solving process (Appendix H), a copy of the Torres et al. (2012) practitioner paper, the EBP action plan template and instructions, the EBP action plan coding form, and the EST sources list and task analyses. Participants were provided a hard copy of each document in a 1-in binder and electronic copies on a USB drive.

**Data collection training manual.** The training manual for the data collectors was identical to the coaching manual for the participants with the addition of a list of all of the scenarios and six sample EBP action plans with completed coding forms. The samples included plans for four randomly selected simulated scenarios and two hypothetical actual scenarios. Data collectors were provided a hard copy of each document in a 1-in binder and electronic copies on a USB drive.

**Dependent Variable**

**EBP action plan fidelity.** The dependent variable was the percentage of fidelity with the EBP action plan protocol. The number of steps completed correctly was divided by the total number of steps and multiplied by 100 to yield a percentage of steps completed correctly (i.e., fidelity). Each EBP action plan was reviewed and steps were scored as correct, incorrect, or not applicable (e.g., original article or training checklist) on the coding form. EBP action plan fidelity with simulated scenarios and actual scenarios was measured. In addition, the experimenter used the participants’ EBP action plans for the actual scenarios to gather descriptive data on implementation fidelity with
the EBP action plans in the classrooms. Using the implementation fidelity checklist, the experimenter scored each step the participant was observed to implement correctly, divided the number of steps correctly implemented by the total number of steps, and multiplied by 100 to yield of percentage of steps implemented correctly.

**Experimental Design**

A multiple probe design across participants was used to assess the effects of coaching on teacher fidelity with EBP action plans.

**Procedures**

Prior to starting the study, simulated scenarios were randomly assigned across sessions for each participant using a random number generator (see Table 2). For each participant, one scenario was randomly assigned per session across conditions (i.e., baseline and coaching). One scenario was randomly assigned to the modeling session and another to the guided practice session; both of these “sessions” took place during the initial coaching session. Data were not collected on the participant’s fidelity with EBP action plans modeled or completed with guided practice during the initial coaching session because the experimenter completed the modeled plan and helped the participant make corrections on the guided practice plan during that session.

**Baseline.** During each baseline session, the experimenter presented the participant with a simulated scenario and said, “Identify the problem and write an EBP action plan.” No other instructions or guidance were provided, and if the participant asked a question, the experimenter replied, “Do your best.” After completing at least three probes for EBP action plans written for simulated scenarios, each participant was asked to write an EBP action plan for one self-identified, actual scenario. Each participant was instructed,
“Identify an actual scenario or classroom problem that you would like to address and write an EBP action plan to address it.”

**Coaching.** During the initial coaching session, the experimenter orally reviewed the rationale, EBP action plan directions, and sources and task analyses. Next, using a simulated scenario randomly assigned to the modeling session for the participant, the experimenter modeled how to complete the EBP action plan. Then, using the simulated scenario randomly assigned to the guided practice session (i.e., another novel scenario), the participant completed an EBP action plan and received praise and corrective feedback as he or she completed each step. No experimental data on the participant’s fidelity were collected during the initial coaching session because the experimenter actively completed the modeled EBP action plan, provided feedback, and helped the participant make corrections on the guided practice EBP action plan.
Table 2. Simulated Scenario Assignments

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<tr>
<td>11</td>
<td>2</td>
<td>12</td>
<td>n/a</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>14</td>
<td>3</td>
<td>n/a</td>
<td>14</td>
</tr>
<tr>
<td>13</td>
<td>3</td>
<td>2</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total # Scenarios</td>
<td>13</td>
<td>13</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

* Scenario used for modeling during initial coaching session.
** Scenario used for guided practice during initial coaching session.

At the beginning of the subsequent coaching session, the participant was given one randomly assigned simulated scenario and instructed to, “Identify the problem and write an EBP action plan to address it.” No other instructions or guidance were provided by the experimenter. If the participant asked for assistance, the experimenter replied, “Do your best.” At the start of each subsequent session, the experimenter provided feedback.
to the participant on the EBP action plan he or she had written during the previous session. Feedback was provided at the start of subsequent sessions rather than immediately following completion of the plan in order to allow time for the experimenter and a research assistant to reach consensus on the selected EST’s essential components and to score the EBP action plan using the coding form. Feedback included review of the fidelity data; praise for steps implemented correctly and corrective feedback and guided revisions to the EBP action plan for incorrect steps; and review of the mastery criteria and participant goal-setting. The experimenter also answered all participant questions during the coaching debrief sessions. The participant was required to achieve mastery criteria including the completion of a minimum of five EBP action plans for simulated scenarios with at least 90% fidelity across the final three consecutive sessions prior to writing an EBP action plan for the actual scenarios identified in baseline.

After achieving mastery with simulated scenarios, the participant was asked to recall the actual scenario he or she had identified in baseline. The experimenter then prompted, “Please identify that problem and write an EBP action plan to address it.” After each participant independently wrote the EBP action plan for his or her actual scenario, a coaching session was conducted. During the coaching session, the experimenter provided the participant feedback on the actual scenario EBP action plan. They discussed and role-played how implementation would be conducted in the classroom. If needed, they revised the action plan and created data sheets and any other necessary materials. Once the participant reported confidence in moving forward, they set a time for the experimenter to observe implementation (i.e., follow-up probe).
**Follow-up probe.** After the participant and experimenter finalized the actual scenario EBP action plan, the experimenter observed the participant during classroom implementation. Using the implementation checklist from the EBP action plan, the experimenter evaluated the extent to which the participant implemented the EST with fidelity in the targeted classroom setting. Sebastian’s follow-up probe took place during reading instruction that he provided to five second grade students in a resource room setting. Marissa’s follow-up probe occurred during one-on-one instruction that she provided in reading and math to a fifth grade student in a resource room setting. Joy’s follow-up probe took place during a supplemental period she proctored daily with 13 eighth grade students in her classroom. Sophie’s follow-up probe occurred during one-on-one instruction that she provided to a 3.5-year-old student in her classroom while staff monitored other students engaging in semi-structured “center” activities.

After the follow-up probe, the participant and experimenter met for a final coaching debrief to review the observation data and to discuss performance and the EBP action plan. The experimenter praised steps implemented correctly and provided corrective feedback with role-play practice for steps implemented incorrectly. Then they discussed advantages and obstacles to EST implementation and made changes to the EBP action plan as needed.

**IOA**

Prior to collecting data, the experimenter provided the research assistants with the data collector training manual. First, the experimenter provided instructions and modeled how to use the website and original article sources. The experimenter modeled how to score two sample EBP action plans written for two random scenarios using the coding
form. Then, the research assistant was provided three sample EBP action plans to independently score using the coding form. Once the research assistant reached 100% agreement with the experimenter on the scoring of three sample EBP action plans (targeting two simulated scenarios and one hypothetical actual scenario), he or she was permitted to serve as an independent data collector. An exact agreement percentage was calculated by scoring each item on the coding form as an agreement or a disagreement, dividing the number of agreements by the total number of agreements and disagreements, and multiplying by 100 to yield a percentage.

**Fidelity of Experimental Conditions**

Prior to collecting data, research assistants were trained to assess the experimenter’s fidelity implementing experimental conditions via instructions and role-play. A task analysis of the experimenter’s behaviors that were to occur was developed for each experimental condition (baseline and intervention; Appendix I). The experimenter provided instructions and modeled fidelity using the task analyses. Then, the research assistant practiced scoring fidelity while observing the experimenter role-play one baseline and one coaching session with another research assistant. Then the experimenter asked the research assistant to explain the steps of each condition, asked the research assistant if he or she had any questions, and answered any questions the research assistant asked. Once trained, research assistants began monitoring the experimenter’s implementation of baseline and intervention sessions using the task analyses. Steps on the task analysis were scored as implemented correctly or incorrectly during each observed session. Percentage fidelity was calculated by dividing the number of steps implemented correctly by the total number of steps and converting to a percentage.
Social Validity

Following the conclusion of participation in experimental conditions, participants were asked to complete an anonymous survey online. The survey included 15 items that participants rated using a 5-point rating scale and three open-ended items to which participants could write extended responses. Questions were designed to obtain information regarding the participants’ perceptions of the goals (e.g., “I feel it is important for special educators to use research-based interventions to help their students succeed”), procedures (e.g., “I enjoyed being coached on my application of the EBP problem-solving process with an actual classroom scenario”), and outcomes (e.g., “I feel confident in my ability to use the EBP problem-solving process to address classroom issues”) of the study (see Appendix J).
Chapter 4: Results

Four special education teachers participated in this study. During the coaching intervention, all four participants met the predetermined criteria (i.e., completion of EBP action plans for at least five simulated scenarios with performance on the final three consecutive EBP action plans at 90% or higher fidelity). Two participants achieved criteria within the first five coaching sessions, and the other two participants achieved criteria within eight coaching sessions. Three participants maintained fidelity levels at 90% or higher on their EBP action plans for actual scenarios; two scored 100% and the other one scored 94%. One participant scored 75% on his EBP action plan for the actual scenario. After receiving coaching on EBP action plans for actual scenarios, descriptive data indicated that all four participants were able to implement their EBP action plans in their classrooms with 100% fidelity and that implementation resulted in desirable student outcomes (based on participants’ reports of student data).

Figure 1 shows the percentage fidelity with EBP action plans for Joy, Sebastian, Marissa, and Sarah for each session across all phases of the study. For each EBP action plan session, the percentage of fidelity with the EBP action plan protocol is indicated. Solid lines denote phase changes. Closed circles indicate percentage fidelity with EBP action plans for simulated scenarios, and open squares indicate percentage fidelity with EBP action plans for actual scenarios. Changes in the dependent variables (i.e., percentage fidelity with EBP action plans on simulated scenarios and on actual scenarios)
are also summarized in Table 3. In the table, means and ranges are reported for percentage fidelity with EBP action plans for simulated scenarios by participant and phase. Actual scores (rather than means and ranges) are reported for percentage fidelity with EBP action plans for actual scenarios because only one plan was written by each participant in each phase. On average, EBP action plans written during baseline took three min for simulated scenarios and five min for actual scenarios. During intervention, EBP action plans written for simulated scenarios and actual scenarios took 30 min on average across participants.

Table 3. Special Educators’ Percentage Fidelity with EBP Action Plans Across Conditions

<table>
<thead>
<tr>
<th>Participants</th>
<th>Simulated Scenarios</th>
<th>Actual Scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline M (range)</td>
<td>Coaching M (range)</td>
</tr>
<tr>
<td>Joy</td>
<td>13.3% (7–27%)</td>
<td>93.7% (82–100%)</td>
</tr>
<tr>
<td>Sebastian</td>
<td>4.4% (0–7%)</td>
<td>94.7% (76–100%)</td>
</tr>
<tr>
<td>Marissa</td>
<td>2.2% (0–7%)</td>
<td>100% (n/a)</td>
</tr>
<tr>
<td>Sarah</td>
<td>2.76% (0–7%)</td>
<td>97.6% (88–100%)</td>
</tr>
</tbody>
</table>
Figure 1. Percentage Fidelity with EBP Action Plan Protocol Across Participants.
Results by Participant

Joy. During baseline, Joy’s procedural fidelity with EBP action plans for simulated scenarios was low ($M = 13\%$, range 7–27\%). On the actual scenario probe, Joy wrote an EBP action plan with 33\% fidelity. Following the initial coaching session during which no data were collected, there was an immediate and substantial increase in level of fidelity with simulated scenarios, from 7\% during the last baseline session to 87\% during the first intervention session. During intervention, Joy’s procedural fidelity data for simulated scenarios were stable, maintaining at levels of 81\% higher than baseline levels ($M = 94\%$, range 82–100\%). There were no overlapping data points between baseline and intervention conditions. Joy’s performance dropped below the 90\% minimum fidelity criterion during her fifth intervention session to 82\%, but she achieved the criterion during the three subsequent sessions. Joy reached the mastery criteria for simulated scenarios in eight intervention sessions.

The problem Joy identified for her actual scenario was the on-task behavior of all 13 male and female eighth grade students (Tier 1) in her self-contained classroom for students with mild to moderate disabilities during a daily, 50-min supplemental period. Joy selected and adapted self-management from NPDC for her EBP action plan. Joy scored 94\% fidelity on her independent completion of the EBP action plan. She missed Step 15 on the EBP action plan coding form because the exact teacher behaviors that were to be performed during each session were unclear.

During the subsequent coaching session, the experimenter helped Joy revise the plan to include observable, measurable teacher behaviors. During the follow-up probe, Joy implemented the self-management training and implementation procedures with
100% fidelity, as scored by the experimenter on the checklists from Joy’s revised EBP action plan. Student data collected during the follow-up probe indicated that all students met their self-management goals; 11 of the 13 students were on-task for 100% of the intervals, one student was on-task for 95% of intervals, and one student was absent. Anecdotally, Joy reported continued success with the intervention two weeks after the follow-up probe.

**Sebastian.** During baseline, Sebastian’s procedural fidelity with EBP action plans for simulated scenarios was low and stable ($M = 4\%$, range 0–7%). On the actual scenario probe, Sebastian wrote an EBP action plan with 20% fidelity. Following the initial coaching session during which no data were collected, there was an immediate and substantial increase in level of fidelity with simulated scenarios, from 0% during the last baseline session to 100% during the first intervention session. During intervention, Sebastian’s procedural fidelity data for simulated scenarios were stable, maintaining at levels of 91% higher than baseline levels ($M = 95\%$, range 76–100%). There were no overlapping data points between baseline and intervention conditions. Sebastian’s performance dropped below the 90% minimum fidelity criterion to 76% during his fifth intervention session, but he achieved the criterion during the next three sessions and the overall mastery criteria for simulated scenarios in a total of eight intervention sessions.

The problem Sebastian identified for his actual scenario was the on-task behavior of five male and female second grade students with mild to moderate disabilities to whom he provided Tier 2 intervention instruction in reading in the resource room for 30 min daily. Sebastian selected and adapted functional communication training (FCT) from NPDC for his EBP action plan. Sebastian scored 75% fidelity on his independent
completion of the EBP action plan. He did not include the necessary materials, a procedure for teaching the students the EBP, specific teacher behavior for regular implementation, or all of the EBP essential components identified by NPDC.

During the subsequent coaching session, the experimenter and Sebastian discussed the appropriateness of using FCT to address the identified problem. After reviewing what FCT would look like in practice, Sebastian decided that another EBP would be more suitable. Together, they searched NPDC for alternative EBPs and selected differential reinforcement, and the experimenter guided Sebastian in revising the EBP action plan. During the follow-up probe, Sebastian implemented the differential reinforcement procedures with 100% fidelity, as scored by the experimenter on the implementation checklist from Sebastian’s revised EBP action plan. Student data collected during the follow-up probe indicated that all students met or exceeded the on-task session criterion (90% of intervals) and received token reinforcers.

**Marissa.** During baseline, Marissa’s procedural fidelity with EBP action plans for simulated scenarios was low and stable ($M = 2\%$, range 0–7\%). On the actual scenario probe, Marissa wrote an EBP action plan with 33\% fidelity. Following the initial coaching session during which no data were collected, there was an immediate and substantial increase in level of fidelity with simulated scenarios, from 0\% during the last baseline session to 100\% during the first intervention session. During intervention, Marissa’s procedural fidelity data for simulated scenarios were stable, maintaining at 100\% across five consecutive sessions. There were no overlapping data points between baseline and intervention conditions. Marissa achieved the mastery criteria with simulated scenarios in five intervention sessions.
The problem Marissa identified for her actual scenario was the on-task and work completion behaviors of a fifth grade male student with mild disabilities to whom she provided Tier 3 intervention instruction in reading and math one-on-one in a resource room. Marissa selected and adapted self-monitoring from NSTTAC for her EBP action plan. Marissa independently completed her EBP action plan with 100% fidelity. During the follow-up probe, Marissa introduced and implemented the self-monitoring procedure with 100% fidelity, as scored by the experimenter on the implementation checklist from Marissa’s EBP action plan. Student data collected during the follow-up probe indicated that the intervention was effective at improving productivity and accurate task completion.

Sophie. During baseline, Sophie’s procedural fidelity with EBP action plans for simulated scenarios was low and stable ($M = 3\%$, range 0–7%). On the actual scenario probe, Sophie wrote an EBP action plan with 13% fidelity. Following the initial coaching session during which no data were collected, there was an immediate and substantial increase in level of fidelity with simulated scenarios, from 0% during the last baseline session to 88% during the first intervention session. During the subsequent intervention session, Sophie’s simulated scenario procedural fidelity data further increased to 100%, and this level maintained for the next three sessions. There were no overlapping data points between baseline and intervention conditions. Sophie achieved mastery criteria with simulated scenarios in five intervention sessions.

The problem Sophie identified for her actual scenario was the color-labeling behavior of a three-year-old boy with cerebral palsy to whom she provided Tier 3 early intervention instruction one-on-one in her inclusive preschool classroom. Sophie selected
and adapted discrete trial teaching from NPDC for her EBP action plan was. Sophie independently completed her EBP action plan with 100% fidelity. During the follow-up probe, Sophie implemented the discrete trial teaching procedure with 100% fidelity, as scored by the coach on the implementation checklist from Sophie’s EBP action plan. Student data collected during the follow-up probe indicated that discrete trial teaching was effective at improving accurate responding within the session. Sophie conducted a post-session probe and the student correctly identified four colors, three more than he had during the pre-session probe. Two weeks after the follow-up probe, Sophie reported continued success with discrete trial teaching, indicating that new stimulus sets had been introduced using the same procedures.

**Patterns in EBP Action Plans**

**Sources.** Participants were coached on how to use five website sources (Torres et al., 2012) to select and adapt ESTs for EBP action plans: (a) Best Evidence Encyclopedia (BEE, www.bestevidence.org); (b) National Professional Development Center on Autism Spectrum Disorders (NPDC, http://autismpdc.fpg.unc.edu/); (c) National Secondary Transition Technical Assistance Center (NSTTAC, www.nsttac.org); (d) National Autism Center (NAC, www.nationalautismcenter.org); and (e) What Works Clearinghouse (WWC, ies.ed.gov/ncee/wwc/). In addition, participants were coached on how to locate original articles referenced by website sources to facilitate the identification of EST procedures in the event a source lacked sufficient detail to outline measurable implementation steps in an EBP action plan. Table 4 summarizes the frequency with which each of the six sources (five websites and original articles) was used across participants during the intervention condition. Participants indicated both the web source
and the original article citation in the event that an original article was used; therefore, the sum percentage of sources in Table 4 is greater than 100%.

No sources were used or referenced by participants during baseline. A total of 30 EBP action plans were written across participants during the intervention condition (26 simulated scenarios, four actual scenarios). None of the participants used NAC in writing their EBP action plans, and BEE was only used once. WWC was used with slightly greater frequency, by one participant twice and two participants once. Although one participant did not use NPDC, the other three used it for a total of 11 EBP action plans. NSTTAC was the most used website source across participants and contributed to the development of 14 EBP action plans (47%). Twelve of the 30 EBP action plans (40%) required the use of original articles in addition to the web source in order for participants to identify and adapt essential practice components. Appendix K lists the 10 original articles used, the sources from which they were identified, the scenarios for which they were used, and the participants who used them. Articles were dated 1987 to 2010. Sebastian and Joy each used a total of four articles to complete six and four scenarios, respectively (there were no limits to the number of times participants were permitted to use the same sources or EBPs). Marissa used three articles across three scenarios, and Sophie used one article for one scenario.
Table 4. Frequency of Sources Used During Intervention

<table>
<thead>
<tr>
<th>Participants (n)</th>
<th>BEE</th>
<th>NAC</th>
<th>NPDC</th>
<th>NSTTA C</th>
<th>WWC</th>
<th>Original Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joy (9)</td>
<td>1</td>
<td>n/a</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Sebastian (9)</td>
<td>n/a</td>
<td>n/a</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Marissa (6)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>5</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Sophie (6)</td>
<td>n/a</td>
<td>n/a</td>
<td>3</td>
<td>3</td>
<td>n/a</td>
<td>1</td>
</tr>
<tr>
<td>Total (% of Sum)</td>
<td>1 (3.3%)</td>
<td>0 (0%)</td>
<td>11 (37%)</td>
<td>14 (47%)</td>
<td>4 (13%)</td>
<td>12 (40%)</td>
</tr>
</tbody>
</table>

**ESTs.** Fifteen ESTs were used alone or in combination across the 30 EBP action plans written during intervention. Table 5 summarizes these ESTs and the frequency of their use. The most frequently used was task analysis by three participants across five plans. Mnemonic devices were used once by each participant on a total of four plans. Self-management or self-monitoring was used by two participants on a total of three plans. Twelve additional ESTs were used once or twice across participants for the other 60% of EBP action plans.
Table 5. Empirically Supported Treatments (ESTs) Used During Intervention

<table>
<thead>
<tr>
<th>ESTs</th>
<th>Joy</th>
<th>Sebastian</th>
<th>Marissa</th>
<th>Sophie</th>
</tr>
</thead>
<tbody>
<tr>
<td>BST$^1$</td>
<td>1</td>
<td>n/a</td>
<td>n/a</td>
<td>1</td>
</tr>
<tr>
<td>CMS$^2$</td>
<td>n/a</td>
<td>n/a</td>
<td>1</td>
<td>n/a</td>
</tr>
<tr>
<td>CTD$^3$</td>
<td>1</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>CWPT$^4$</td>
<td>1</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>DTT$^5$</td>
<td>1</td>
<td>n/a</td>
<td>n/a</td>
<td>1</td>
</tr>
<tr>
<td>FCT$^6$</td>
<td>n/a</td>
<td>1</td>
<td>n/a</td>
<td>1</td>
</tr>
<tr>
<td>LTMP$^7$ + CBI$^8$</td>
<td>n/a</td>
<td>1</td>
<td>n/a</td>
<td>1</td>
</tr>
<tr>
<td>PA$^9$</td>
<td>n/a</td>
<td>2</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ESTs</th>
<th>Joy</th>
<th>Sebastian</th>
<th>Marissa</th>
<th>Sophie</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD$^{10}$</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>RR$^{11}$</td>
<td>n/a</td>
<td>n/a</td>
<td>1</td>
<td>n/a</td>
</tr>
<tr>
<td>SM$^{12}$</td>
<td>1</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>SMgmt$^{13}$</td>
<td>1</td>
<td>n/a</td>
<td>2</td>
<td>n/a</td>
</tr>
<tr>
<td>SST$^{14}$</td>
<td>1</td>
<td>n/a</td>
<td>1</td>
<td>n/a</td>
</tr>
<tr>
<td>TA$^{15}$</td>
<td>1</td>
<td>3</td>
<td>n/a</td>
<td>1</td>
</tr>
<tr>
<td>VM + TA</td>
<td>n/a</td>
<td>1</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

$^1$ = Behavioral skills training  
$^2$ = Cognitive mapping strategy  
$^3$ = Constant time delay  
$^4$ = Class-wide peer tutoring  
$^5$ = Discrete trial teaching  
$^6$ = Functional communication training  
$^7$ = Least-to-most prompting  
$^8$ = Community-based instruction  
$^9$ = Positive Action curriculum  
$^{10}$ = Mnemonic devices  
$^{11}$ = Repeated reading  
$^{12}$ = Spelling Mastery  
$^{13}$ = Self-monitoring/self-management  
$^{14}$ = Social skills training/groups  
$^{15}$ = Task analysis  
$^{16}$ = Video-modeling
**Action plan accuracy.** A more detailed analysis of the EBP action plans revealed some patterns in teacher fidelity with particular steps. During baseline with simulated scenarios, participants only demonstrated correct step performance in the first section of the plan on items related to the identification of the problem. Specifically, all teachers were able to identify the name or number of students in a simulated scenario at least once (EBP action plan coding form Item 1). For one baseline simulated scenario each, Joy and Sophie accurately identified the problem (Item 3). Joy also correctly identified the setting and other students present for one simulated scenario (Items 6 and 7). Across 14 baseline simulated scenarios, the teachers implemented 11 steps out of 60 in their EBP action plans (23% accuracy across participants). All teachers’ fidelity improved in baseline with EBP action plans written for actual scenarios. They all identified the problem, and three of four identified the name or number of students and their age or grade level. Joy identified the students’ disabilities, but none of the teachers identified the RTI tier. Joy and Marissa identified the setting, and Marissa indicated other students were not present in the actual situation. Sophie selected an EBP (Item 9) to use to target her identified problem. The intervention she selected in baseline, DTT, was also identified and used to address the actual problem during intervention.

During intervention, Sebastian had one error related to problem identification (i.e., RTI tier) for a simulated scenario. None of the participants missed steps related to selecting an EBP during intervention. The most common errors on EBP action plans for simulated scenarios during intervention were related to adapting an EST. On three occasions, Joy did not list all of the necessary materials (Item 12), and this was an issue for Sebastian once. Joy and Sebastian failed to include a training fidelity checklist
necessary to initially teach the students for one simulated scenario each. Joy and Sebastian also failed to indicate the specific teacher behaviors that were to occur during implementation on three scenarios each. For one simulated scenario, Joy did not include all of the EBP essential components. On one simulated scenario, Steve failed to include a procedure for monitoring student outcomes. All teachers completed EBP action plans for actual scenarios with greater fidelity in intervention than during baseline. Marissa and Sophie completed theirs with 100% fidelity, and Joy only missed one step, failing to indicate observable, measurable teacher behaviors to occur during implementation. Sebastian’s fidelity with adapting the EBP in his action plan for the actual scenario declined. He did not accurately include the necessary materials, a training fidelity checklist, specific teacher behaviors, or a procedure for monitoring student response to intervention.

IOA

Table 6 summarizes the IOA data for participant results. IOA was assessed for simulated scenario EBP action plans for 33%, 33%, 33%, and 40% of baseline and for 38%, 38%, 40%, and 40% of coaching sessions for Joy, Sebastian, Marissa, and Sophie, respectively. IOA was assessed on 100% of actual scenario EBP action plans for all participants across baseline and coaching conditions. An agreement was defined as both observers scoring an item on the EBP action plan coding form identically. Percentage agreement for each session was calculated by dividing the number of agreements by the number of disagreements plus agreements and converting to a percentage. Mean agreement was 97% across all simulated scenario EBP action plans (range, 90% to 100%) and 98% across all actual scenario EBP action plans (range, 88 to 100%). Mean
agreement for simulated scenario sessions was 97% (range, 96% to 100%) for Joy, 92% (range, 90% to 100%) for Sebastian, 100% for Marissa, and 96.9% (range, 90% to 100%) for Sophie. Mean agreement for actual scenario EBP action plans was 100% for Joy and Sebastian, 97% (range, 94% to 100%) for Marissa, and 94% (range, 88% to 100%) for Sophie.

Table 6. Interobserver Agreement

<table>
<thead>
<tr>
<th>Condition/Scenario Type</th>
<th>Participants/Percentage of Sessions Scored</th>
<th>Participants / Percentage of Agreement on Fidelity of EBP Action Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>Joy 33.3% Sebastian 33.3% Marissa 33.3% Sarah 40%</td>
<td>Joy 100% Sebastian 100% Marissa 100% Sophie 97.1%</td>
</tr>
<tr>
<td>Actual</td>
<td>100% 100% 100% 100%</td>
<td>100% 100% 94.1% 88.2%</td>
</tr>
<tr>
<td>Intervention</td>
<td>Simulated 37.5% 37.5% 40% 40%</td>
<td>96% 90.2% 100% 100%</td>
</tr>
<tr>
<td>Actual</td>
<td>100% 100% 100% 100%</td>
<td>100% 100% 100% 100%</td>
</tr>
</tbody>
</table>

**Procedural Fidelity**

Percentage fidelity was calculated by dividing the number of steps implemented correctly by the total number of steps and converting to a percentage. Research assistants assessed the extent to which experimental conditions were implemented as intended for 50% of baseline sessions and 100% of initial coaching sessions for all participants. Fidelity of subsequent coaching sessions was assessed for 56% of sessions for Joy and Sebastian and for 33% of sessions for Marissa and Sophie. Fidelity of experimental conditions was 100% across conditions, sessions, and participants.

**Social Validity**
Participant responses to the social validity survey ranked items are summarized in Table 7. All of the participants indicated that they strongly agreed with the goals of the study. Specifically, they indicated strong agreement with the importance of engaging in EBP as a problem-solving process and the importance of special educators using research-based interventions to help their students succeed. All of the participants disagreed with the statement, “Prior to participating in this study, I had been explicitly taught problem-solving skills for addressing academic and social issues in the classroom.”

With respect to the procedures, one participant was neutral, two were in agreement, and one was in strong agreement with statements related to enjoying practice with and coaching on writing EBP action plans for simulated scenarios. One participant agreed and three strongly agreed with statements about enjoying the writing of and coaching on EBP action plans for actual scenarios. One participant was neutral, two agreed, and one strongly agreed on the necessity of using simulated scenarios to acquire EBP action planning skills. Two were neutral and two agreed that they would have preferred to use only actual classroom scenarios relevant to their particular teaching situations. With respect to the website used, one disagreed, two were neutral, and one agreed with the statement that they were teacher-friendly. One participant agreed and three strongly agreed that the task analyses helped them to navigate the websites. One participant disagreed and three agreed that once identified, it was easy to create an implementation checklist for a selected EST.

With respect to the outcomes of the study, two participants agreed and two strongly agreed that they feel confident in their ability to use the EBP problem-solving
process to address classroom issues. Two participants indicated neutrality and two indicated agreement regarding the likelihood of future use of the EBP problem-solving process. Finally, two participants agreed and two strongly agreed that teacher preparation programs and professional development opportunities for special educators should include coaching on the EBP problem-solving process.

Two participants wrote responses to the open-ended questions on the social validity survey. With respect to the goals of the study, one participant wrote, “EBP is talked about often, but not taught often, especially implementation; would like to see training for EBP in the classroom setting more often for educators.” Another wrote, “The study definitely helped me to help my students.” With respect to the procedures of the study, one participant wrote, “Using simulated scenarios is vital for learning how to navigate the websites and create implementation checklists.” Another wrote, “While the simulated scenarios weren’t the most fun, they were necessary and helped me in the end.” Finally, with respect to the outcomes of the study, one participant wrote, “Would have liked to do one more real scenario,” and another wrote, “The last week or two of my student teaching, specifically with my targeted “problem” group, was the smoothest by far.”
Table 7. Number of Responses per Social Validity Survey Ranked Item

<table>
<thead>
<tr>
<th>Question Domain/Item</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. As a special educator, I believe it is important to engage in evidence-based practice (EBP) as a problem-solving process.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>3. I believe it is important for special educators to use research-based interventions to help their students succeed.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>Procedures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I enjoyed the practice using the EBP problem-solving process with simulated scenarios.</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. I enjoyed being coached on my application of the EBP problem-solving process with simulated scenarios.</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. I enjoyed using the EBP problem-solving process with an actual classroom scenario.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>7. I enjoyed being coached on my application of the EBP problem-solving process with an actual classroom scenario.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
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</table>

(Continued)
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</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>The use of simulated scenarios was necessary in my acquisition of the EBP problem-solving skills.</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10.</td>
<td>The websites were teacher-friendly.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11.</td>
<td>The task analyses helped me navigate the websites.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12.</td>
<td>Once identified from a website, it was easy to create an implementation checklist for a selected practice.</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Outcomes**

<p>| | | | | |</p>
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</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>I feel confident in my ability to use the EBP problem-solving process to address classroom issues.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14.</td>
<td>I will use the EBP problem-solving process to address classroom issues in the future.</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>15.</td>
<td>I think that teacher preparation programs and/or professional development opportunities for special educators should include coaching on the EBP problem-solving process.</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Chapter 5: Discussion

The purpose of this study was to evaluate the effects of coaching on four novice special education teachers’ fidelity of writing EBP action plans consistent with a taught protocol. A multiple probe design across participants was utilized. Participants were introduced to the intervention in a staggered fashion. Results indicate that coaching effectively improved participants’ fidelity with EBP action plans written for simulated and actual scenarios. Moreover, descriptive data indicate that participants were able to implement EBP action plans written for actual scenarios in their classrooms with 100% fidelity. Further, high levels of satisfaction with the intervention goals, procedures, and outcomes were reported by the teacher participants, indicating that coaching might be a socially valid intervention to teach and support novice special educators as they learn to engage in EBP.

These findings are consistent with the coaching literature reviewed in Chapter 2. The procedures used in this study incorporated the key elements of coaching identified in the review: (a) an initial, highly interactive training or coaching session; (b) direct observations of performance in the classroom; and (c) data-based debrief with corrective and affirmative feedback. The results of this study support the notion that coaching is an effective practice that should be utilized in special education teacher preparation programs (Cornelius & Nagro, 2014). Further, these findings suggest that coaching is effective with novice in-service teachers.
The remainder of this chapter will focus on the effects of coaching on the participants’ fidelity with EBP action plans for simulated and actual scenarios (Research Questions 1 and 2); the extent to which the participants implemented their EBP action plans with fidelity in their classrooms to address actual scenarios (Research Question 3); the social validity of the intervention (Research Question 4); the limitations of the current study along with suggestions for future research; and finally, implications for teacher educators and administrators as well as special education teachers and practitioners.

**Effects of Coaching on Teachers’ Fidelity with EBP Action Plans**

A functional relation between coaching and increased fidelity with EBP action plans for simulated scenarios was demonstrated across participants. Although the lack of repeated measurement of EBP action plans for actual scenarios precludes conclusions regarding a functional relation between coaching and increased fidelity on those plans, it is likely that coaching is responsible for the behavior change across teachers. Improvements in performance were demonstrated when, and only when, the teacher was exposed to the intervention. With coaching, teachers effectively acquired and implemented the first three skills or steps of EBP: (1) identifying problems; (2) selecting ESTs; and (3) adapting ESTs, as evidenced by gains in the fidelity of completion of EBP action plans for idiosyncratic, hypothetical and real classroom situations. In general, some patterns were revealed with respect to the participants’ use of sources and ESTs and their fidelity with particular steps of the EBP action plan protocol.

**Sources.** Participants were coached on how to select and adapt ESTs for EBP action plans by using one of five website sources (Torres et al., 2012) and, if necessary, locating original articles. During baseline, no sources were used or referenced by
participants. During intervention, all 30 of the EBP action plans included a website source; 12 plans also included references to original articles.

There are several potential explanations for the differential use of the various sources. For example, no participants used NAC as a source from which to select and adapt an EST. In order to identify an EST from NAC, teachers must first download a manual. The website requires users to enter geographical and occupational information before downloading a 258 page manual. Unless teachers already have a particular intervention in mind, they must skip to the second chapter of the manual to review 30 pages of information covering the 11 “Established Treatments.” After reviewing each of these ESTs, teachers may select one; however, implementation procedures described in the manual are unlikely sufficient to yield reliable replication. Therefore, use of NAC would likely result in a necessity to locate an original article. It is possible that this combination of factors related to increased response effort ultimately decreased participants’ motivation to use NAC when selecting action plan ESTs.

BEE, another infrequently used source, requires teachers to navigate pages to specify the age level and topic of the identified problem (e.g., beginning reading). Similar to NAC, teachers must then download an extensive full report. For example, the full report *Effective Beginning Reading Programs: A Best-Evidence Synthesis* (Slavin, Lake, Chambers, Cheung, & Davis, 2009), is 168 pages in length. Once a full report has been downloaded, a teacher must locate and consult the summary tables to identify a study with a positive effect size, find the citations in the reference list, and then locate the original article to identify the procedures used. As suggested regarding participants’ lack of use of NAC, it may be that the response effort required to select and adapt an EST
using BEE suppressed teachers’ use of it. Joy was the only participant who used BEE, and she only did so on one occasion to address Simulated Scenario 4, an issue related to all students’ performance (Tier 1) of addition and subtraction problems with fractions and decimals in a fifth grade inclusion classroom (see Appendix B). Using BEE, Joy selected the EST class-wide peer tutoring, but implementation steps are not listed on the BEE website, so she had to then locate an original article. Although Joy wrote an EBP action plan to address this issue with high fidelity (94%), it required the greatest amount of time of all the plans she wrote. The median amount of time Joy utilized writing an EBP action plan during intervention was 30 min; this plan required 75 min. It is therefore not surprising that she did not use BEE a second time.

Similar to BEE, WWC requires users to select a relevant topic or outcome domain (e.g., reading comprehension for students with disabilities). Teachers can then choose from a list of potential interventions and download a relatively briefer full report. As with BEE and NAC, the implementation procedures described in the report are likely insufficient for adapting the EST into the EBP action plan; use of WWC typically leads to location of an original article. Every time WWC was used in this study, an original article was also cited in the EBP action plan. Despite these complications, three participants used WWC for a total of four scenarios written during intervention. It is possible that the shorter length or simplicity of the WWC full reports relative to NAC and BEE motivated participants to use WWC. For example, the repeated reading report is 38 pages and intervention effectiveness and references are clearly labeled and described. It should be noted, however, that only one of the participants who used WWC used it a second time. This may suggest that, similar to NAC and BEE, the high levels of response
effort required to use WWC may not be sufficiently reinforcing to sustain use by special education teachers in the selection and adaptation of EBPs for action plans.

NPDC was used by three participants for 11 (37%) of the 30 EBP action plans written during intervention. Anecdotally, the participants who used NPDC reported that the implementation checklists available directly from the website made it a preferred source. However, all ESTs selected from NPDC required the participants to adapt the essential components listed on the website in order to score correctly on Steps 12 and 15 (“All of the specific materials necessary to implement the EST are identified,” and “The steps are adapted…indicating the exact teacher behaviors that will be performed during each session”) of the EBP action plan coding form. Despite the need to adapt an EST selected from NPDC, participants appeared to find the source useful, and each of the three participants who used it did so for three or more scenarios. This may have been because relatively less response effort was required than with NAC, BEE, or WWC. Out of the three participants who used NPDC, Sebastian was the only one who located an original article. He found an article with procedures for implementing task analysis that he liked and adapted it for a total of three EBP action plans for simulated scenarios. When Joy and Sophie used NPDC, they were able to identify all of the essential elements of selected ESTs from the website and to adapt them into their EBP action plans without the need for locating original articles.

NSTTAC was the most frequently used site (47% of scenarios), likely because of its user-friendly features and flexibility, as suggested by participants. The website offers a few entry point options from which users can navigate the selection of ESTs. For example, teachers may review a summary page of ESTs and their evidence, locate ESTs
organized by practice type or by skills taught (e.g., mnemonics or academic skills), or go directly to lesson plan starters organized by content domain (e.g., employment skills, life skills). Many of the ESTs include lesson plan starters that list the materials needed and specific teacher behaviors that should occur during implementation. Further, they include procedures for monitoring student outcomes and require minimal, if any, adaptations in order to make the EST suitable for the context of a given scenario. When it is necessary to locate an original article, the website features references to articles that include clear descriptions of the procedures, eliminating much of the guesswork. Out of the five website sources, NSTTAC appeared to require the least amount of response effort; therefore, it is not surprising that the participants used it most frequently when selecting and adapting ESTs for their EBP action plans.

During intervention, participants included references to original articles in addition to website sources in 12 of the 30 EBP action plans (40%). Although researchers have emphasized the importance of adhering to the core features of EBPs during classroom implementation (e.g., Cook et al., 2008; Torres et al., 2012), much more research is needed to determine which components are truly essential for all practices. However, in an attempt to capture teacher behavior related to this recommendation, the experimenter and a research assistant independently and then collaboratively outlined the essential components of all ESTs for which original articles were identified. Agreement between experimenter and research assistant on independent component identification was 100% on 9 out of the 10 articles. For one article, the research assistant had identified an extra step that was removed after reaching consensus with the experimenter. Despite the complexity of this approach to identify EST essential components, it only took
approximately 10 min per article. Moreover, essential components were reliably identified across the experimenter, research assistants, and teacher participants. When original articles were used, teachers identified and included 100% of the essential components identified in the consensus agreement outlines made by the experimenter and research assistants. It is possible that these participants gained experience reading research articles in their teacher preparation programs. Teachers who receive their preparation from programs that do not emphasize the importance of research in effective teaching practices may need more targeted support in the identification of procedures from original references.

**ESTs.** It is likely that the participants’ coursework, teacher preparation, and professional development experiences influenced their selection of ESTs. Further, the adaptability of particular ESTs likely played a role in their selection. For example, task analysis can be used to teach any number of tasks that can be broken into component steps. The three teachers who selected task analysis used it alone or in conjunction with another EST (e.g., prompting) to teach skills such as putting on and zipping up a coat, retelling stories to demonstrate reading comprehension, and adding and subtracting fractions. Similarly, mnemonic devices can be adapted to a wide range of instructional targets. Teachers wrote EBP action plans that included the use of mnemonic devices to teach job application skills and branches of the government, for example. Based on anecdotal report from instructors who taught courses in the undergraduate and graduate programs in which the teacher participants were enrolled, mnemonic devices are discussed, modeled, and used in several courses. Familiarity with the EST may have increased teachers’ comfort in selecting and adapting it. Similarly, self-management and
self-monitoring procedures are explicitly taught in courses all of the teachers had taken prior to participating in the study. Further, prior to and during the study, the teachers likely self-managed their own behavior around lesson planning, studying, and completing tasks; therefore, selecting and adapting it for the scenarios may have been simpler than using an unfamiliar EST.

**Action plan accuracy.** During baseline with simulated scenarios, participants only demonstrated correct step performance in the first section of the plan on items related to the identification of the problem. Interestingly, the EST Sophie identified on her EBP action plan for the actual scenario in baseline was the same one she selected and adapted for the actual scenario during intervention. This may suggest that rather than wanting to address a student behavior, Sophie wanted to address her own behavior by adopting a teaching method she was likely exposed to in one of her graduate courses.

The patterns observed in performance related to specific action planning steps may highlight areas in which teacher educators and coaches should focus their training and coaching efforts. For example, adapting procedures to include observable and measurable teacher behaviors is arguably the most important step of creating an EBP action plan, but it is the step with which participants most frequently struggled. An action plan that fails to describe how exactly the teacher will implement the EST is unlikely to lead to successful implementation. It is possible that more value should be given to that step on the coding form. This step may be particularly challenging for teachers who have never received explicit training and practice in writing observable and measurable behavior objectives for their students or themselves.

**Effects of Coaching on Teachers’ EBP Action Plan Implementation Fidelity**
Although implementation fidelity with the EBP action plans in the classroom cannot be causally linked with the intervention, all four participants were observed to implement their EBP action plans with 100% fidelity, as assessed by the experimenter during classroom observations. These descriptive data suggest that novice special education teachers can implement self-created EBP action plans with fidelity to address problems they identify in their classrooms.

Three of the participants chose to address student behavior problems for actual scenarios, and one chose to target an academic skill as the problem. Although it is possible that the novelty of the interventions influenced student responding and that treatment effects would eventually diminish, all three participants who implemented behavior management techniques anecdotally reported continued success with the intervention for up to four weeks after the follow-up probe. Additionally, the students with whom the interventions were implemented reported enjoyment with the procedures suggesting that in addition to being effective and relatively simple to implement, the ESTs were considered to be socially valid by its recipients (i.e., the students).

**Social Validity**

All of the participants indicated strong agreement with the goals of the study related to the importance of engaging in EBP as a problem-solving process and the importance of special educators using ESTs. Importantly, none of the participants indicated that they had been explicitly taught problem-solving skills for addressing academic and social issues in the classroom. These results suggest that participants recognized the value of using ESTs and engaging in EBP although they had never been taught a systematic process for doing so. One participant indicated a desire to see
“training for EBP in the classroom setting more often for educators.” Teacher educators and professional development coordinators may be wise to focus efforts on providing teachers explicit support as they learn to engage in EBP.

A majority of participants agreed that use of simulated scenarios was necessary for skill acquisition. One even indicated that it was “vital for learning how to navigate the websites and create implementation checklists.” Another’s comment that, “While the simulated scenarios weren’t the most fun, they were necessary and helped me in the end,” suggests that the use of simulated scenarios was valued as a critical aspect of learning the EBP action planning process. Overall, participants preferred writing and receiving coaching on EBP action plans for actual scenarios, and two indicated that it would have been preferable to only write EBP action plans for actual classroom scenarios relevant to their particular teaching situations. This is not surprising given the amount of time required to complete an EBP action plan. Given the time constraints many teachers face, it can be expected they would prefer to allocate their time to tasks directly relevant to helping their students achieve desirable outcomes.

Participants’ perceptions regarding the ease of use of the websites varied, but all four indicated the task analyses helped them navigate the sources. It may be useful for website designers to consider including tutorials for users that describe where to find ESTs and how to integrate them into practice. Future research may evaluate the navigability of websites by gathering information such as the number of mouse clicks and time spent before an EST is identified from a given source. Organizations like WWC and NAC that intend to disseminate information regarding effective practice may be wise to recruit external evaluations of their websites by real teachers and practitioners. One
participant indicated that it was not easy to create implementation checklists once ESTs had been selected from the websites, so these sources may also want to consider how best to support teachers in adapting interventions for practical classroom implementation.

It is encouraging that all of the participants cited increased confidence in their ability to engage in EBP to address classroom issues as a result of their participation in the study, and two agreed they will use the process in the future. On the other hand, two participants gave neutral responses regarding whether they will use the process in the future, suggesting that perhaps the response effort required to complete the EBP action plans was too high or did not yield sufficiently reinforcing consequences to motivate continued usage. Future research should investigate how to balance the effort required for teachers to engage in EBP with the outcomes of the process. Although teachers may identify classroom “problems” to target, it may be that the issues are not sufficiently problematic to warrant an EBP action plan. Perhaps abbreviated EBP action plans could be used to address such issues. For problems of greater magnitude, coaches may spend more time helping teachers appreciate the value of writing and implementing the plan with respect to student outcomes. One participant independently acknowledged that participation “definitely helped me to help my students”; other teachers may need the coach’s support in explicitly recognizing the impact of the plan in improving student outcomes. Similarly, the participants may have found the EBP action planning process to be more beneficial if more actual scenarios had been targeted. It can be assumed that once a teacher learns to engage in EBP as a problem-solving process, the natural reinforcers maintaining his or her behavior are the student outcomes. Contacting those natural contingencies of reinforcement more frequently when initially learning the
process may increase teachers’ motivation to continue using it. Finally, all of the participants indicated that teacher preparation programs and professional development opportunities for special educators should include coaching on the EBP problem-solving process. Teacher educators, administrators, and professional development personnel may be wise to incorporate coaching procedures into their practice to support teachers learning to engage in EBP.

In addition to the formally collected data, informal anecdotal data were collected that offer additional support regarding the social validity of the study. For example, on the first day of classroom implementation, Sebastian sent a text message to the experimenter indicating he had successfully implemented the intervention and his students’ behavior had never been better. Similarly, the student with whom Marissa implemented her EBP action plan reported enjoying the intervention. During the follow-up probe he said, “I feel like this makes it easier for me to be on-task. It really helps me get my work done!” Sebastian and Marissa also reported presenting their EBP action plans as “EBP portfolios” during job interviews for post-graduation special education teaching positions. This anecdote suggests these teachers not only valued the process of engaging in EBP but were proud of their ability to do so and believed it demonstrated their competency in using research-based interventions to address a wide range of academic and behavioral issues. Moreover, the student teaching coordinator reported that Sebastian and Marissa thoroughly enjoyed participating in the study.

**Limitations and Future Research**

This study extended the literature base and addressed some limitations of previous research on the use of coaching to increase procedural fidelity and to support teachers
engaging in EBP as a problem-solving process. Despite these contributions, several limitations should be considered. First, Sebastian failed to generalize high levels of fidelity to the EBP action plan he wrote for the actual problem he identified. Despite scoring 100% fidelity on the two prior EBP action plans written for simulated scenarios, Sebastian’s fidelity with the EBP action plan for the actual scenario was only 75%. Further, the initially selected EST did not match the problem. When the experimenter talked Sebastian through a descriptive functional analysis about the problem, it became clear that the real issue was Sebastian’s behavior. Sebastian described peer and teacher attention as the most frequent consequences for off-task student behavior, and he was unable to describe if and how on-task behavior was positively reinforced. The experimenter suggested targeting Sebastian’s allocation of reinforcement, rather than the students’ behavior.

One explanation for Sebastian’s selection of an unfit intervention is that the coaching intervention did not require teachers to select ESTs with evidence specific to the participant characteristics. In their guide for implementing ESTs, Torres and colleagues (2012) recommend teachers consider the student, environmental, and instructor characteristics before choosing an EST, but they admit selection can be difficult. Although participants were required to explain how selected an EST matched an identified problem, the rationale did not guarantee empirical support of the EST matching the scenario’s idiosyncratic variables. Future researchers should design measures that more explicitly assess the extent to which ESTs match the student, environmental, and teacher characteristics.
An alternative explanation for Sebastian’s performance is related to the notion of professional wisdom or clinical expertise. Although the fundamental necessity of professional judgment is commonly agreed upon (e.g., Cook et al., 2008; Cook & Cook, 2013; Detrich et al., 2013; Slocum et al., 2012; Torres et al., 2012), how best to define and measure it remains unclear. Teachers must continuously employ professional judgments while engaging in EBP, making decisions in light of the best available evidence, client values, and contextual factors (Spencer et al., 2012). Although Sebastian and Marissa had nearly identical educational and practical experiences in their teacher preparation program, Marissa wrote EBP action plans for simulated and actual scenarios with higher fidelity than Sebastian. This might suggest that subtle variations in an individual’s education combined with unique overall life experiences may contribute to one’s collective professional wisdom. Future researchers should explore how to best quantify this complex variable and its influence on teachers’ engagement in EBP as a problem-solving process. Similarly, coach clinical expertise should be explored. Specifically, what “tools” must be in the coach’s repertoire of professional wisdom in order for them to be effective in supporting teachers?

The differential responding among teachers in this study suggests that all novice special educators may not possess sufficient professional wisdom to make decisions independently when engaging in EBP as a problem-solving process. Some teachers may need more intensive support including additional guided practice selecting ESTs that match the identified problem and adapting them to have sufficient contextual fit while adhering to their essential components. This finding is supported by evidence in the coaching literature that a “one-size-fits-all” approach to professional development may
not be appropriate for all teachers (e.g., DiGennaro et al., 2007; Minor et al., 2014; Myers et al., 2011).

The issue of identifying and intervening with nonresponders among teacher recipients of professional development may be effectively managed by providing coaching in a tiered model of support that utilizes the same RTI logic used with K–12 students. Myers and colleagues (2011) experimented with this approach by providing performance feedback with varying levels of intensity for teacher praise rates. Following a Tier 1 intervention (school-wide training on positive behavior support), teachers who were nonresponsive (i.e., rates of praise did not increase) were provided Tier 2 intervention consisting of brief consultation prior to implementation and weekly performance feedback. When needed, more individualized support was provided as a Tier 3 intervention via more frequent performance feedback. Future research should examine the effects of applying RTI logic when coaching teachers to engage in EBP as a problem-solving process. Researchers could examine specific aspects of the 5-step process and assess effects of varied levels of coaching intensity according to teachers’ performance.

A second limitation is that there were no IOA data collected on the follow-up probes. The descriptive data do not warrant any causal linkage of implementation fidelity to the coaching intervention. Nonetheless, the observation data would be more reliable if a second observer had independently scored the teachers’ and students’ behavior during the observation session (Johnston & Pennypacker, 2009). Similarly, the internal and external validity of the fidelity data for both writing and implementing actual scenario EBP action plans data should be interpreted with caution. Demonstration of a functional relationship via single-subject research requires repeated measurement of dependent
variables across conditions (Horner et al., 2005). Teachers only wrote one EBP action plan for an actual scenario and were observed implementing that plan just once. The extent to which they would be able to identify additional problems across different tiers of RTI and different subjects or skill domains is unclear. Further, it remains unknown whether teachers could continue to write and implement effective EBP action plans.

Future researchers should ensure IOA data are collected on all experimental and descriptive measures. Moreover, future research is needed to systematically evaluate the effects of coaching teachers on the first three steps of the EBP process (i.e., identifying the problem and selecting and adapting an EST) on their fidelity with the fourth and fifth steps (i.e., implementing and monitoring student response). It may be difficult to capture the extent to which a teacher implements an EST during baseline given that he or she has unlikely written a viable EBP action plan. One option researchers may consider is videotaping implementation probes during baseline once the participant has identified the targeted time period and setting. Then, after the teacher has created a comprehensive EBP action plan during intervention, researchers could review the videotape to measure baseline levels of performance using the implementation checklist. Researchers should also investigate the extent to which fidelity with writing and implementing EBP action plans generalizes across additional actual classroom scenarios and across time.

Third, the primary dependent variable for this study was a permanent product of verbal behavior. Concerns regarding say-do correspondence have been documented in the training literature (Lloyd, 2002; Paniagua, 1990). That is, the extent to which individuals do what they say they are going to do is questionable. Although it is encouraging that the participants in this study were observed to implement their EBP action plans with 100%
fidelity, aligned with other researchers’ recommendations (e.g., Codding et al., 2005; Hawkins & Heflin, 2011), future research is needed to determine the durability of such effects and the influence of reactivity to the coach’s presence on teacher performance. Jones (2009) found low rates of reported use of research-based procedures; these ratings were verified during direct observation of the participants in practice. Further, low levels of correspondence were found between what teachers said they were doing in their classrooms and their observed behavior.

Fourth, the coaching intervention was time consuming for the coach and teachers. The instructional design of the curriculum that was used to coach the teachers to engage in EBP required extensive planning and attention to detail. All coaching sessions took place in the teachers’ classrooms across four school districts. Future research should explore methods to enhance the cost-effectiveness of coaching novice special education teachers to engage in EBP. For example, remote coaching may be a viable alternative to in-person coaching consultations. Further, the number of sessions and time required for teachers to reach the mastery criteria may be unreasonable for some teachers. Future research should explore strategies to expedite the coaching and EBP action plan development processes. Additionally, future research should examine coaching teachers to identify and prioritize problems and to write and implement more than one EBP action plan simultaneously.

Fifth, although local progress monitoring may be considered the best evidence for or against an EST (Slocum et al., 2012), it was not measured in this study. The purpose of this study was to examine the effects of coaching on teachers’ fidelity with, primarily, the first three pieces of the EBP problem-solving process and, secondarily, the fourth.
However, the significance of diligent follow-through and active monitoring of progress is not to be downplayed. Future research should extend the results of the current study by using coaching to improve teachers’ fidelity with monitoring and responding effectively to students’ response to intervention.

Sixth, the provision of delayed feedback is a limitation. In general, it is recommended that performance feedback is delivered immediately following performance (e.g., Cornelius & Nagro, 2014); unfortunately, it was not possible to fulfill this expectation given the procedures used to identify and evaluate the teachers’ inclusion of essential EST components. Further, coaching was provided up to 10 days following an observation session. Although the experimenter attempted to provide coaching on the day following the observation, this was not possible due to time constraints of the school calendar and unexpected emergencies. For example, Joy went out of town for a week during intervention to attend a funeral; spring break occurred for all of the participants during intervention; and three of the participants had 10 days of mandatory state testing while participating in the study. It is encouraging that despite this limitation, all of the participants were able to achieve mastery criteria in eight or fewer sessions. These results address the recommendation by Cavanaugh (2013) for research to examine the effects of delayed performance feedback and suggest it may be effective up to 10 days following an observation; however, future research should more systematically evaluate the effects of feedback provided after various time intervals between observation and coaching sessions.

Finally, familiarity with the experimenter (i.e., coach) may have influenced participants’ response to the coaching intervention. The experimenter was a teaching
assistant for the ABA for Teachers course that Marissa and Sebastian had taken one year prior to participating in the study, and she provided Joy and Sophie behavior analytic supervision the semester prior to and during the study. It is possible that these previously established relationships enhanced the participants’ receptiveness and responses to the coaching procedures. Future research should examine whether participants respond differentially to coaches with whom they are and are not familiar.

**Implications for Practice**

Notwithstanding its limitations, results of the current study imply several suggestions for teacher educators and administrators as well as special education teachers and practitioners to consider as related to their professional practice and improving student outcomes.

**Teacher educators and administrators.** Teacher educators and school leaders should consider institutionalizing coaching as an ongoing support model for teachers designed to improve fidelity with EBP and student outcomes. For example, schools could align the coaching procedures described in this study to existing mentor or resident educator models by identifying experienced and successful teachers to serve as peer coaches for pre-service, first, second, or third year teachers. In the context of teacher preparation, student teacher mentors may be taught to use the effective elements of coaching (i.e., initial active training, observation with fidelity data collection, and performance feedback). University student teaching supervisors would be wise to also adopt these practices. As recommended by Kretlow and Bartholomew (2010), coaching may replace the typical “observe and give feedback” conduct of student teaching
supervision. Collecting data on specific teacher behaviors may improve the teacher candidate’s performance as well as the coach or supervisor’s sense of purpose.

Special education teachers and practitioners. Having teachers identify problems and create plans for solutions may be a motivational strategy to improve implementation fidelity (Minor et al., 2014). Special education teachers make countless decisions throughout the course of a school day (Detrich et al., 2013). Given the infinite and ongoing nature of problems encountered by teachers, it is unreasonable to expect them to write EBP action plans to address all issues. For this study, participants chose an actual classroom problem that was aligned with their students’ IEP goals and their classroom situations. Alignment of client (student) values and contexts (school and classroom settings) is central to the EBP problem-solving process. Client values and context is recommended as the guiding principle for determining which problems to target using EBP action plans.

Although all of the participants were enrolled in special education programs that emphasized behavior analytic principles and procedures, it is interesting to note that three of the four chose to target student behavior problems. This may be expected given that teacher preparation programs infrequently equip novice teachers with effective classroom management strategies (Greenberg, McKee, & Walsh, 2013). Teachers can learn to systematically address student behavior problems by developing EBP action plans to guide implementation of promising practices and monitoring of student outcomes. Once instructional control and effective classroom management procedures are in place, teachers can engage in EBP to address academic outcomes.

Conclusion
Coaching teachers to engage in EBP as a problem-solving strategy may help them to manage a variety of student behaviors. Rather than becoming proficient in the application of a few procedures that may not be suitable in all situations, EBP offers a systematic method for analyzing problems and deriving solutions. Doing so may require less instructional time and have wider generality than training teachers how to apply a set of solutions (Hundert, 1982). Most of the coaching research that has been conducted with special education teachers has focused on improving implementation fidelity with skills that have been selected by the researchers. The present study examined the effects of coaching teachers to engage in EBP as a problem-solving process that can be used to address any number of teacher-identified problems with teacher-selected and adapted solutions. It is not sufficient to train and hope (Baer et al., 1968); this study actively programmed for generalization by targeting teacher skills that can be applied to solve problems with other students and in other settings. The results of this study suggest that coaching may be a promising method for supporting novice special education teachers as they learn to engage in EBP.
References

(*Indicates inclusion in review of studies)


Wing Institute. (2013). *Teacher Professional Development*. Presented at the 39th Annual Convention of the Association for Behavior Analysis International (ABAI), Minneapolis, MN.


APPENDIX A: LITERATURE REVIEW RESULTS
## Journals Included in Special Education Coaching Review

<table>
<thead>
<tr>
<th>Journal</th>
<th>Articles per Journal n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Interventions</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Education and Treatment of Children</td>
<td>2 (9)</td>
</tr>
<tr>
<td>Educational Sciences: Theory &amp; Practice</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Journal of Applied Behavior Analysis</td>
<td>6 (26)</td>
</tr>
<tr>
<td>Journal of Behavioral Education</td>
<td>2 (9)</td>
</tr>
<tr>
<td>Journal of Emotional and Behavioral Disorders</td>
<td>2 (9)</td>
</tr>
<tr>
<td>Journal of Positive Behavioral Interventions</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Journal of Special Education</td>
<td>1 (4)</td>
</tr>
<tr>
<td>School Psychology Quarterly</td>
<td>2 (9)</td>
</tr>
<tr>
<td>School Psychology Review</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Teacher Education and Special Education</td>
<td>4 (17)</td>
</tr>
<tr>
<td><strong>Total articles</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>
### Participants and Settings

<table>
<thead>
<tr>
<th>Authors</th>
<th>Teacher</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>Experience</td>
</tr>
<tr>
<td>Preservice Teachers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capizzi et al (2010)</td>
<td>3</td>
<td>0-2 years</td>
</tr>
<tr>
<td>Morgan et al. (1992)</td>
<td>5</td>
<td>Practicum</td>
</tr>
<tr>
<td>Morgan et al. (1994)</td>
<td>5</td>
<td>Practicum/ none</td>
</tr>
<tr>
<td>Rathel et al (2008)</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>Scheeler et al. (2009)*</td>
<td>3</td>
<td>n/a</td>
</tr>
<tr>
<td>Scheeler et al. (2009)^</td>
<td>2</td>
<td>Practicum</td>
</tr>
<tr>
<td>Inservice Teachers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bethune &amp; Wood (2013)</td>
<td>3</td>
<td>3-15 years</td>
</tr>
<tr>
<td>Coddng et al. (2005)</td>
<td>5</td>
<td>6-30 months</td>
</tr>
<tr>
<td>Coddng et al. (2008)</td>
<td>1</td>
<td>3 years</td>
</tr>
<tr>
<td>Study</td>
<td>Sample Size</td>
<td>Age</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
<td>-----</td>
</tr>
<tr>
<td>DiGennaro-Reed et al. (2010)</td>
<td>4</td>
<td>1–4.5 years</td>
</tr>
<tr>
<td>DiGennaro et al. (2007)</td>
<td>4</td>
<td>2–30 years</td>
</tr>
<tr>
<td>DiGennaro et al. (2005)</td>
<td>2</td>
<td>0–4 years</td>
</tr>
<tr>
<td>Duchaine et al (2011)</td>
<td>3</td>
<td>2–8 years</td>
</tr>
<tr>
<td>Hawkins &amp; Heflin (2011)</td>
<td>3</td>
<td>3–7 years</td>
</tr>
<tr>
<td>Hundert (1982)</td>
<td>2</td>
<td>4–7 years</td>
</tr>
<tr>
<td>Minor et al. (2014)</td>
<td>3</td>
<td>1–2 years</td>
</tr>
<tr>
<td>Moore et al. (2002)</td>
<td>1</td>
<td>n/a</td>
</tr>
<tr>
<td>Myers et al. (2011)</td>
<td>2</td>
<td>4–11 years</td>
</tr>
<tr>
<td>Pence et al (2014)</td>
<td>6</td>
<td>1–16 years</td>
</tr>
<tr>
<td>Simonsen et al. (2010)</td>
<td>3</td>
<td>13–16 years</td>
</tr>
<tr>
<td>Sterling-Turner et al. (2002)</td>
<td>3</td>
<td>4–6 years</td>
</tr>
<tr>
<td>Sutherland et al (2000)</td>
<td>1</td>
<td>3 years</td>
</tr>
<tr>
<td>Vuran &amp; Olcay Gul (2012)</td>
<td>3</td>
<td>2 years</td>
</tr>
</tbody>
</table>
1 Vol = participation was voluntary, Ref = participation was due to a referral from principal or supervisor

2 ES = Elementary school, MS = Middle school, HS = High school

3 RR = Resource room or separate room for small group instruction, ESE = exceptional student education/special education self-contained separate classroom where students receive majority of instruction, IN = Inclusion or regular/general education classroom

4 At-Risk = At-Risk of placement in special education or of diagnosis, ADHD = Attention deficit hyperactivity disorder, DD = Developmental disabilities, SLI = speech/language impairments, PDD-NOS = Pervasive developmental disorder-not otherwise specified, DS = Down syndrome, AUT = autism, LD = learning disabilities, E/BD = emotional/behavioral disorders (e.g., anxiety, conduct disorder, bipolar disorder), MR = mental retardation, ID = intellectual disability, N/TBI = non-traumatic/traumatic brain injury, VI = visual impairment, MD = multiple disabilities, HI hearing impairment, SCZ = schizophrenia, PD = physical disabilities, OHI = other health impairments
# Independent Variables

<table>
<thead>
<tr>
<th>Coach¹/Authors</th>
<th>Pre-Coaching²</th>
<th>Coaching³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimenter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Codding et al. (2005)</td>
<td>2 week training on IBPs prior to study: Review, modeling, practice, &amp; immediate PFB; Daily, ongoing informal FB</td>
<td>12-min debrief on same day as observation outside of classroom; reviewed plan &amp; provided praise &amp; constructive FB</td>
</tr>
<tr>
<td>Codding et al. (2008)</td>
<td>Two, 4-hr training sessions: Review, modeling, &amp; role-playing IBP. Ongoing weekly informal consultation</td>
<td>5–20 min debrief with praise &amp; corrective FB conducted 5–10 min (sometimes 30–60 min) following observation; Alternated observer present v. absent conditions</td>
</tr>
<tr>
<td>DiGennaro-Reed et al. (2010)</td>
<td>Prior to BL, 1-hr review of IBP &amp; 5-item posttest; 45-min prior to each observation, 4–6 min IVM</td>
<td>Experimenter provided verbal PFB about prior session then played video, pausing to highlight aspects teacher had implemented incorrectly during previous session.</td>
</tr>
<tr>
<td>DiGennaro et al. (2007)</td>
<td>Initial meeting with didactic instruction, review, &amp; modeling of plan; Training via coaching &amp; corrective FB while teacher implemented intervention until 2 sessions at 100%</td>
<td>GS + Student PFB: Daily written PFB &amp; graphs of student data; Teacher PFB + DR/MC: Daily written PFB &amp; graphs of teacher &amp; student data; If below 100%, directed rehearsal meeting to review &amp; practice, if 100%, meeting cancelled</td>
</tr>
<tr>
<td>DiGennaro et al. (2005)</td>
<td>Initial training involved didactic instruction, modeling, coaching, &amp; immediate corrective FB until teacher reached 100% integrity on 2 consecutive sessions</td>
<td>Daily written PFB &amp; graph of teacher &amp; student data left in school mailbox after observation; If below 100%, directed rehearsal with review &amp; practice on following day, prior to next observation, if 100%, meeting cancelled</td>
</tr>
<tr>
<td>Duchaine et al (2011)</td>
<td>After BL, 45-min individual training with lecture &amp; discussion, review of BL data, suggestions on providing BSP &amp; goal-setting</td>
<td>After each observation, written PFB left in folder on teacher's desk; Prior to every third observation, 5-min meeting with reminder of goal, examples, discussion</td>
</tr>
<tr>
<td>Study</td>
<td>Training Details</td>
<td>Follow-Up Details</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hawkins &amp; Heflin (2011)</td>
<td>After BL, initial pre-observation meeting to discuss praise, review BL rate of BSP, &amp; use videotape to point out &amp; praise teacher's BSP</td>
<td>During subsequent pre-observation meetings, reminder about BSP &amp; its benefits, review of graphed data &amp; teacher's individual criterion, examples of BSP from the previous lesson, &amp; praise of BSP use seen in videotape</td>
</tr>
<tr>
<td>Hundert (1982)</td>
<td>Two 1-hour measurement trainings 25 page manual &amp; exercises, additional practice &amp; corrective FB; Programming training: 82-page manual, &amp; exercises, additional practice &amp; corrective FB</td>
<td>During first 2 sessions after measurement training, reviewed teachers' objectives &amp; measurement procedures for focal target behavior, provided praise &amp; corrective FB; At the end of programming training, teachers wrote IBP for focal behavior, provided praise &amp; corrective FB</td>
</tr>
<tr>
<td>Martens et al. (1997)</td>
<td>20-min on the day before intervention, conducted Problem Identification Interview, reviewed BL data, &amp; set goal</td>
<td>Teacher was given a sealed note at beginning of next session indicating whether goal was met, praising teacher's efforts, &amp; listing the desired child behaviors</td>
</tr>
<tr>
<td>Minor et al. (2014)</td>
<td>1 week prior to BL, initial training session, given IBPs, &amp; description &amp; discussion of procedures</td>
<td>PFB: During observation, corrective statements &amp; 30 min after observation, 5-min PFB with praise &amp; 2 examples; PFB + graph + PSC: Identical to PFB + review of graph, corrective FB, &amp; problem-solving</td>
</tr>
<tr>
<td>Moore et al. (2002)</td>
<td>Initial training: Written &amp; verbal instructions, oral quiz, role-play with student; Enhanced training: Review role-play data, praise, &amp; corrective FB; modeling and practice with PFB</td>
<td>Provided PFB after every classroom probe</td>
</tr>
<tr>
<td>Rathel et al (2008)</td>
<td>Initial meeting to review BL data, explain benefits of praise, review copy of definitions, rationales, &amp; examples</td>
<td>On day of observation, FB via email (corrective FB, praise, summary of data &amp; graphs); Weekly meetings with experimenter &amp; supervisor to address additional questions</td>
</tr>
<tr>
<td>Study</td>
<td>Phase 1 &amp; 2: Problem Identification &amp; Analysis</td>
<td>Phase 3: Direct training &amp; data review, discussion, praise &amp; corrective FB, review with modeling, &amp; role-play; One practice session with student with PFB</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sterling-Turner et al. (2002)</td>
<td>Interviews, reviewed data, developed IBP, didactic, indirect training</td>
<td>Prior to first observation, review of BL data, benefits &amp; examples of BSP were provided, agreed on criterion.</td>
</tr>
<tr>
<td>Sutherland et al. (2000)</td>
<td></td>
<td>Prior to each session, reminded of goal, given example of BSP; Immediately after observation, reviewed data, verbal PFB &amp; praise</td>
</tr>
<tr>
<td>Vuran &amp; Olcay Gul (2012)</td>
<td>BL: Written instructions; Training: Manuals &amp; explanations of difficult materials</td>
<td>Videotape of best performance &amp; in vivo modeling by experimenters; Teachers viewed both &amp; compared, found errors, &amp; gave corrective FB</td>
</tr>
<tr>
<td>Consultant</td>
<td>Consultant (Ph.D student) was trained by experimenter</td>
<td>1-hr weekly review of videotaped lesson, affirmative &amp; corrective FB, completed evaluation form, identified 3 effective teaching behaviors &amp; 3 areas for improvement</td>
</tr>
<tr>
<td>Morgan et al. (1992)</td>
<td>15-hr coach training by graduate student; Supervisor modeled effective behaviors in weekly seminars; Coach reviewed behaviors, strategies, &amp; target areas during initial debrief</td>
<td>2–3 weekly observations &amp; debriefs; During observation, coach provided affirmative &amp; corrective FB &amp; on 2 occasions briefly modeled with students; Immediately after session, met for 5-8 min, reviewed performance, answered questions, summarized progress</td>
</tr>
<tr>
<td>Pence et al. (2014)</td>
<td>Trainers: Workshop 9 months prior &amp; refresher; Trainees: FA readings, review, modeling, &amp; practice with FB</td>
<td>After each session, 2-min praise &amp; corrective FB</td>
</tr>
</tbody>
</table>
### Research Assistant

<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention and Support</th>
<th>Observations and Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheeler et al. (2009)*</td>
<td>BL: Corrective FB, praise, examples after each session; Prior to BIE: Practiced receiving BIE FB</td>
<td>20-30 min observations, praise &amp; reminders via BIE</td>
</tr>
<tr>
<td>Scheeler et al. (2009)^</td>
<td>BL: Corrective FB, praise, examples after each session; Prior to BIE: practiced receiving BIE FB</td>
<td>20-30 min observations praise &amp; reminders via BIE</td>
</tr>
<tr>
<td>Simonsen et al. (2010)</td>
<td>30–60 min initial training by professor &amp; grad student with instruction, discussion, examples, &amp; rehearsal, chose self-management strategies; Initial coaching session to review FB sheet &amp; data</td>
<td>Daily PFB: form with graphs, examples, &amp; Brief verbal PFB from data collector immediately before next session (2 teachers) or via email on same day as observation (1 teacher)</td>
</tr>
</tbody>
</table>

* Experiment 1 in Scheeler et al. (2009)
^ Experiment 2 in Scheeler et al. (2009)

1 Coach = Person who provided feedback or coaching support; Experimenter category includes coaches reported as researcher or first author; Consultant = Not identified as a researcher or experimenter, Undergraduate peer = Student peer enrolled in preservice program

2 FBA = Functional behavior assessment, IBP = Individualized behavior plan, BL = Baseline, DTT = Discrete trial training, SP = Simultaneous prompting, SWPBS = School-wide positive behavior support, FA = Functional analysis, BSP = Behavior specific praise, BIE = Bug-in-ear device

3 FB = Feedback, PFB = Performance feedback, IVM = Individualized video modeling, GS = Goal setting, DR/MC = Directed rehearsal with meeting cancellation, SR = negative reinforcement (i.e., meeting cancellation), PSC = Problem-solving consultation, RTI = Response to Intervention
## Experimental Designs and Dependent Variables

<table>
<thead>
<tr>
<th>Authors</th>
<th>Design</th>
<th>Behavior</th>
<th>Dimension</th>
<th>Criteria</th>
<th>Outcome</th>
<th>Teacher DVs</th>
<th>Student DVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bethune &amp; Wood (2013)</td>
<td>MBD across participants</td>
<td>IBP</td>
<td>Content/quality</td>
<td>2 sessions, 90%</td>
<td>2 of 3 increased fidelity with coaching; 1 did not require coaching</td>
<td>Appropriate &amp; Problem</td>
<td>All 3 increased appropriate &amp; decreased problem</td>
</tr>
<tr>
<td>Capizzi et al. (2010)</td>
<td>MBD across participants</td>
<td>Instruction, BSP, OTR</td>
<td>Content/quality, Quantity</td>
<td>n/a</td>
<td>All 3 increased fidelity &amp; rate of BSP; 2 of 3 increased rate of OTRs</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Codding et al. (2005)</td>
<td>MBD across dyads</td>
<td>IBP</td>
<td>Content/quality</td>
<td>&quot;Stabilized&quot; performance</td>
<td>4 of 5 increased antecedent fidelity; All 5 increased consequence fidelity</td>
<td>Problem, but no data</td>
<td>n/a</td>
</tr>
<tr>
<td>Codding et al. (2008)</td>
<td>MBD across staff with ATD</td>
<td>CWBP</td>
<td>Content/quality</td>
<td>n/a</td>
<td>Teacher increased fidelity</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>DiGennaro-Reed et al. (2010)</td>
<td>MBD across teachers</td>
<td>IBP</td>
<td>Content/quality</td>
<td>n/a</td>
<td>Both increased fidelity</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>DiGennaro et al. (2007)</td>
<td>MBD across dyads</td>
<td>IBP</td>
<td>Content/quality</td>
<td>100%~ &amp; 3 days, 100%</td>
<td>All 4 increased fidelity</td>
<td>Problem</td>
<td>All 4 decreased</td>
</tr>
<tr>
<td>DiGennaro et al. (2005)</td>
<td>MBD across dyads</td>
<td>IBP</td>
<td>Content/quality</td>
<td></td>
<td>All 4 increased fidelity</td>
<td>Problem</td>
<td>3 of 4 students decreased</td>
</tr>
<tr>
<td>Study</td>
<td>MBD across</td>
<td>Intervention</td>
<td>Quantity</td>
<td>Results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duchaine et al. (2011)</td>
<td>Teachers</td>
<td>BSP</td>
<td><del>/</del></td>
<td>All 3 increased rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawkins &amp; Heflin (2011)</td>
<td>Participants with ABAB</td>
<td>BSP, NBSP, NEG</td>
<td>Individual criterion, 3 sessions</td>
<td>Problem: 2 of 3 increased BSP, 2 decreased NBSP; Slight increase for NEG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hundert (1982)</td>
<td>Teachers</td>
<td>IBP</td>
<td>n/a</td>
<td>Both increased fidelity following programming training and feedback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martens et al. (1997)</td>
<td>Students</td>
<td>Praise</td>
<td>n/a</td>
<td>Teacher increased frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor et al. (2014)</td>
<td>Dyads</td>
<td>IBP</td>
<td>90%</td>
<td>Problem, but no data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moore et al. (2002)</td>
<td>Subjects</td>
<td>FA</td>
<td>n/a</td>
<td>Teacher increased fidelity following training with rehearsal, modeling, and PF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morgan et al. (1992)</td>
<td>Trainees</td>
<td>Instruction</td>
<td>n/a</td>
<td>All 5 increased effective behaviors &amp; decreased ineffective behaviors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morgan et al. (1994)</td>
<td>Trainees</td>
<td>Instruction, BSP, NBSP, OTR</td>
<td>n/a</td>
<td>All 5 increased rate of instruction and BSP; 4 increased NBSP; 3 increased OTR slightly; All 21 students mastered lessons at same rate as during teacher-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>MBD across</td>
<td>Behavior</td>
<td>Quantity, Process</td>
<td>Sessions, Ratio/Fidelity</td>
<td>Outcome 1</td>
<td>Outcome 2</td>
<td>Composite scores</td>
</tr>
<tr>
<td>----------------------</td>
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<td>-------------------</td>
</tr>
<tr>
<td>Myers et al. (2011)</td>
<td>MBD across teachers</td>
<td>BSP, NBSP, NEG</td>
<td>Quantity, Process</td>
<td>3 sessions, 6 BSP &amp; 4:1 ratio</td>
<td>Both increased rates of praise</td>
<td></td>
<td>Decrease problem &amp; increase appropriate</td>
</tr>
<tr>
<td>Pence et al. (2014)</td>
<td>MBD across subjects</td>
<td>FA</td>
<td>Content/quality</td>
<td>90%</td>
<td>All 6 achieved high levels of fidelity following training &amp; increased fidelity with brief PF when fidelity decreased below 90%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Rathel et al. (2008)</td>
<td>MBD across teachers</td>
<td>Praise &amp; NEG</td>
<td>Quantity, Process</td>
<td>n/a</td>
<td>Both decreased frequency of NEG &amp; increased frequency of positive behaviors</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Scheeler et al. (2009)*</td>
<td>MBD across participants</td>
<td>Instruction</td>
<td>Content/quality</td>
<td>ns, 90%</td>
<td>All 3 increased fidelity &amp; reached criterion</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Scheeler et al. (2009)*</td>
<td>MBD across participants</td>
<td>Instruction</td>
<td>Content/quality</td>
<td>3 sessions, 90%</td>
<td>Both increased fidelity &amp; reached criterion</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Simonsen et al. (2010)</td>
<td>MBD across behaviors</td>
<td>Prompts, OTR, BSP</td>
<td>Content/quality, Quantity</td>
<td>n/a</td>
<td>All 3 increased level, trend, or stability of each skill</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Sterling-Turner et al. (2002)</td>
<td>MBD across consultees</td>
<td>IBP</td>
<td>Content/quality</td>
<td>n/a</td>
<td>2 of 3 low fidelity after indirect training; All 3 increased with direct training + PF</td>
<td>Appropriate (for 1 student) &amp; Problem (for all 3 students)</td>
<td>1 of 1 increased appropriate°; All 3 decreased problem</td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Procedures</td>
<td>Content/Quality</td>
<td>Quantity</td>
<td>Rates</td>
<td>Behavior</td>
<td>Notes</td>
</tr>
<tr>
<td>--------------------------------------------</td>
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<td>-----------------------</td>
<td>----------</td>
<td>---------------------</td>
<td>---------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sutherland et al (2000)</td>
<td>ABAB</td>
<td>NBSP, BSP</td>
<td>n/a</td>
<td>Teacher increased</td>
<td>Appropriate</td>
<td>Increases in appropriate behavior with increased rates of BSP</td>
<td></td>
</tr>
<tr>
<td>Vuran &amp; Olcay Gul (2012)</td>
<td>MPD across</td>
<td>DTT trials</td>
<td>3 sessions, 95%</td>
<td>All 3 increased fidelity</td>
<td>Appropriate</td>
<td>All students increased correct responding; 2 reached 100% accuracy, and 1 reached 75%</td>
<td></td>
</tr>
</tbody>
</table>

* Experiment 1 in Scheeler et al. (2009)
^ Experiment 2 in Scheeler et al. (2009)
* Appropriate behavior was targeted for only one student.
1 MBD = Multiple baseline design, ATD = Alternating treatments design, ABAB = withdrawal or reversal design, MPD = Multiple probe design
2 IBP = Individualized behavior plan or function-based intervention, Instruction = Instructional trials, effective teaching behaviors, or lesson components, OTR = Opportunities to respond or rate of pupil responding, CWBP = Classwide behavior plan, NBSP = Non-behavior specific, general praise statements, BSP = behavior specific, contingent praise statements, NEG = Reprimands or negative statements or interactions, FA = Functional analysis, DTT = Discrete trial training
3 Dimension refers to the dimension of procedural fidelity that was measured and reported as the dependent variable. Content/quality = content and quality of intervention or assessment procedures, measured as percentage of steps implemented accurately or with fidelity/integrity. Quantity = rate or frequency of intervention or assessment procedures, Process = ratio contrasting intervention or assessment procedures to other responses (i.e., positive to negative statements or interactions)
4 Performance criteria to move to next stage or to discontinue intervention procedures. ~100% = If the participant achieved 100% fidelity, the consultation meeting was cancelled (i.e., negative reinforcement contingency).
5 PF = Performance feedback, PSC = Problem-solving consultation
6 Problem behaviors included noncompliance, tantrums, off-task, work refusal, wandering, mimicking, or out-of-seat behavior; inappropriate speech, vocalizations, sexual or social behaviors; minor or major aggression, public exposure, property destruction, head-shaking, self-injurious behavior, or screaming. Appropriate included compliance, functional communication or replacement behaviors, academic engagement or performance, appropriate vocalizations, or on-task behavior.
APPENDIX B: SIMULATED SCENARIOS
Simulated Scenario Assignments

<table>
<thead>
<tr>
<th>Session</th>
<th>Joy</th>
<th>Sebastian</th>
<th>Marissa</th>
<th>Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>5</td>
<td>5</td>
<td>11</td>
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<tr>
<td>3</td>
<td>15</td>
<td>11</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>2(^*)</td>
<td>15(^*)</td>
<td>12(^*)</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>10(^{**})</td>
<td>13(^{**})</td>
<td>4(^{**})</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>10</td>
<td>15</td>
<td>5(^*)</td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>7</td>
<td>3</td>
<td>10(^{**})</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td>1</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>12</td>
<td>n/a</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>14</td>
<td>3</td>
<td>n/a</td>
<td>14</td>
</tr>
<tr>
<td>13</td>
<td>3</td>
<td>2</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total # Scenarios</td>
<td>13</td>
<td>13</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

* Scenario used for modeling during initial coaching session.
** Scenario used for guided practice during initial coaching session.
### Evidence-Based Practice (EBP) Action Plan

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
<th>Scenario:</th>
</tr>
</thead>
</table>

**Pinpoint**

Number and/or Names of Students: ____________________________________

Age and/or Grade Level and/or ES, MS, HS: __________________________

Disability and/or Category (mild/mod; mod/intensive): ________________

Area of Student Need: _____________________________________________

RTI Tier: _______________________________________________________

Setting: _________________________________________________________

Other Students and/or Staff: ________________________________ or N/A

**Select**

EBP: ___________________________________________________________

Source: www.bestevidence.org    www.nationalautismcenter.org


Original Article (if applicable): ________________________________

Rationale: ____________________________________________________

**Adapt**

Materials: ______________________________________________________

<table>
<thead>
<tr>
<th>Training Procedures Fidelity Checklist (if applicable)</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>5.</td>
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</tbody>
</table>
### EBP Implementation Fidelity Checklist

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>10.</td>
<td></td>
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</tr>
</tbody>
</table>

**Student Baseline & Response to Intervention**

**Who will collect this data?**

________________________________________________________________________

**When and where will it be collected?**

________________________________________________________________________

**What data will be collected and how?**

________________________________________________________________________

**Student Data:**

<p>| | | | |</p>
<table>
<thead>
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<td></td>
</tr>
</tbody>
</table>
APPENDIX D: EBP ACTION PLAN INSTRUCTIONS
<table>
<thead>
<tr>
<th>Evidence-Based Practice (EBP) Action Plan Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong> Write your name here.</td>
</tr>
<tr>
<td><strong>Date:</strong> Write the date here. Scenario: Write the scenario number and type (simulated or actual) here.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Pinpoint</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number and/or Names of Students: Write name(s) and/or number of students to target with the EBP.</td>
</tr>
<tr>
<td>Age and/or Grade Level and/or ES, MS, HS: Write age and/or grade level and/or circle ES for Elementary School, MS for Middle School, or HS for High School.</td>
</tr>
<tr>
<td>Disability and/or Category (mild/mod; mod/intensive): Write the students’ disabilities and/or circle the applicable disability category (mild-to-moderate or moderate-to-intensive).</td>
</tr>
<tr>
<td>Area of Student Need: Describe the academic or behavioral target related to the student(s)’ academic or behavioral performance in measurable, observable terms.</td>
</tr>
<tr>
<td>RTI Tier: Identify Tier 1 (whole class), Tier 2 (small group), or Tier 3 (individual)</td>
</tr>
<tr>
<td>Setting: Write the period and/or class and/or time and/or classroom setting.</td>
</tr>
<tr>
<td>Other Students and/or Staff: List the other students and staff present or circle N/A.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Select</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow the task analyses for using the Web Sources to identify and select an appropriate EBP from a source with catalogued EBPs for students with disabilities.</td>
</tr>
<tr>
<td>Original Article: If applicable, provide the reference for the original article from which the essential components of the EBP were identified.</td>
</tr>
<tr>
<td>Rationale: List at least one reason for the selection of this EBP.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Adapt</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials: List all of the specific materials necessary to implement the EBP. Do not list any unnecessary materials.</td>
</tr>
<tr>
<td>Training Fidelity Checklist: If necessary, list the objective, measurable steps that you will use to train students and/or paraprofessionals as needed. If the EBP can be implemented without explicit training, a training fidelity checklist is not necessary.</td>
</tr>
<tr>
<td>Implementation Fidelity Checklist: List the objective, measurable steps that you will use to implement the EBP or include a task analysis if one is already available. Be sure to include all of the essential components of the EBP and to adapt it to the unique classroom context and particular area of student need, indicating the exact teacher behaviors that will be performed during each session at the targeted time and in the targeted setting.</td>
</tr>
</tbody>
</table>
**Student Baseline and Response to Intervention:** Answer the following questions and create a table to input student data.

Who will collect this data?

__________________________________________________________________________

When and where will it be collected?

__________________________________________________________________________

What data will be collected and how?

__________________________________________________________________________

**Student Data:**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
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<td></td>
</tr>
</tbody>
</table>
APPENDIX E: EBP ACTION PLAN CODING FORM
### Evidence-Based Practice (EBP) Action Plan

<table>
<thead>
<tr>
<th>Participant:</th>
<th>Data Collector:</th>
<th>IOA: Yes or No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario:</td>
<td>Date:</td>
<td>YES</td>
</tr>
</tbody>
</table>

#### Pinpoint

1. Number of students and names (if applicable) are identified.
2. Student(s) age &/or grade level &/or elem/middle/high school is identified.
3. Student(s) disability &/or category (mild/mod, mod/severe) is identified.
4. Area of student need is identified and described in measurable, observable terms and is related to the student(s) academic or behavioral performance.
5. Response to intervention tier is identified.
6. Setting (period &/or class &/or time &/or classroom) is identified.
7. Other students &/or staff are identified or marked “N/A.”

#### Select

8. A source with catalogued EBPs for students with disabilities based on systematic evidence-based reviews source of the EBP is identified.
9. A research-based intervention (evidence-based practice, EBP) is selected.
10. If applicable, the original article from which the EBP essential components are identified is listed.
11. At least one reason for the selection of the EBP is identified.

#### Adapt

12. All of the specific materials necessary to implement the EBP are identified. No unnecessary materials are listed. (May cross-reference implementation procedures to ensure which materials are utilized/necessary).
13. If necessary, a training fidelity checklist outlines the objective, measurable steps that will be used to train students and/or paraprofessionals. If the EBP can be implemented without explicit training, a training fidelity checklist is not necessary.
14. An implementation fidelity checklist outlining objective, measurable steps for implementing the EBP is written or included if already available.
15. The steps are adapted to address the unique classroom context and particular area of student need, indicating the exact teacher behaviors that will be performed during each session at the targeted time/in target setting.
16. The implementation fidelity checklist includes all of the essential components of the EBP.
17. A procedure for monitoring baseline and response to intervention is described and includes what, who, how, when, and where the student data will be collected.

### Total:
APPENDIX F: EST SOURCES
## EST Sources

<table>
<thead>
<tr>
<th>Web Sources</th>
<th>Population &amp; Resource Topics</th>
</tr>
</thead>
</table>
| **Best Evidence Encyclopedia** (BEE)  
www.bestevidence.org | Early childhood through high school  
Reading, mathematics, English Language Learners, technology, school reform |
| **National Autism Center** (NAC)  
www.nationalautismcenter.org  
(download National Standards Report to identify EBPs and supporting research articles) | Individuals with autism ages 3–21  
Antecedent packages, behavioral packages, comprehensive behavioral treatment for young children, joint attention intervention, modeling, naturalistic teaching strategies, peer training package, pivotal response treatment, schedules, self-management, story-based intervention package |
| **National Professional Development Center on Autism Spectrum Disorders** (NPDC on ASD)  
http://autismpdc.fpg.unc.edu/national-professional-development-center-autism-spectrum-disorder  
http://autismpdc.fpg.unc.edu/evidence-based-practices | Individuals with autism ages 3–21  
Antecedent-based intervention, differential reinforcement of alternative, incompatible, or other behavior, discrete trial teaching, extinction, functional behavior assessment, functional communication training, naturalistic intervention, parent-implemented intervention, peer-mediated instruction and intervention, picture exchange communication system, pivotal response training, prompting, reinforcement, response interruption/redirection, self-management, social narratives, social skills groups, task analysis, computer aided instruction and speech generating devices, time delay, video modeling, visual support |
| **National Secondary Transition Technical Assistance Center** (NSTTAC)  
www.nsttac.org  
http://www.nsttac.org/content/evidence-based-practices-secondary-transition  
http://www.nsttac.org/content/evidence-based-practices-organized-skill-being-taught | Secondary students  
Transition, functional life skills, academic skills, IEP and career planning, self-management, communication, social skills, student-focused planning, student development, family involvement, and program structure |
| **What Works Clearinghouse** (WWC)  
http://ies.ed.gov/ncee/wwc | Early childhood through postsecondary  
Literacy, math, dropout prevention, postsecondary education, science, behavior management, children and youth with disabilities |
APPENDIX G: EST SOURCES TASK ANALYSES
Using Best Evidence Encyclopedia (BEE)

www.bestevidence.org

1. On the left-hand side of the homepage, click on the link to the appropriate program review.
   a. For example, if you are targeting elementary school-aged students’ reading comprehension, click on “Elementary” under the heading “Reading.”
2. On the right-hand side of the program review page, click on the link to the “Full Report.”
3. Scroll to the bottom of the report to the summary tables.
4. Identify a study with a positive test size that relates to your targeted area.
5. Locate the reference in the reference list.
6. Locate the original article following the “Locating Original Articles” task analysis.
7. Use the procedures outlined in the Method section of the article to write your EBP Action Plan Preparation, Training, and Implementation Checklists.

Using National Autism Center (NAC)

www.nationalautismcenter.org

1. Click “Resources” from the options at the top of the homepage.
2. Click the green link: “Click here to download your free pdf reports.”
3. Enter your information where required and click “Submit.”
4. Click on the “Educator Manual” link to download the report.
5. Refer to the Table of Contents: 2. Research Findings of the National Standards Project to locate page numbers for the 11 Established Treatments.
6. Scroll down to the page number of the intervention of interest, or go to p. 39 for an overview.
7. If possible, use the descriptions in the research findings to create the implementation fidelity checklist.
8. If the implementation steps cannot be discerned from the research findings summary, refer to the recommended readings and reference lists beginning p. 69 to locate an original article.
9. Locate the original article following the “Locating Original Articles” task analysis.
10. Use the procedures outlined in the Method section of the article to write your EBP Action Plan Preparation, Training, and Implementation Checklists.
Using National Professional Development Center on Autism Spectrum Disorders (NPD on ASD)

autism.fpg.unc.edu

1. Click “Evidence-Based Practices” at the top of the homepage.
2. Scroll down to the list of Evidence-Based Practices.
3. Click on a blue practice that is hyperlinked.
4. Review the Overview and Steps for Implementation.
5. Scroll down to the Implementation Checklist for the EBP, and either copy and paste the checklist into your EBP Action Plan or type in steps, modifying as needed for your classroom context.
   a. Be sure that all of the steps are observable and measurable.
   b. Be sure that the EBP Action Plan includes separate implementation checklists for the development of materials/preparation, initial training, and implementation.

Using National Secondary Transition Technical Assistance Center (NSTTAC)

www.nsttac.org

1. Click on the “Evidence-Based Practices” tab at the top of the homepage.
2. Below the title “Evidence-Based Practices” click on the blue link “Descriptions of Practices and Predictors.”
   a. Review the Practices and Descriptions to identify an appropriate EBP to try using.
   b. Locate an original article cited in the References by following the “Locating Original Articles” task analysis.
   c. Use the procedures outlined in the Method section of the article to write your EBP Action Plan Preparation, Training, and Implementation Checklists.
3. OR, Skip Step 2…. On the left-hand side of the page, click either “Evidence-Based Practices in Secondary Transition” or “Evidence-Based Practices Organized by Skills Being Taught” or one of the EBPs listed under “Academic Evidence-Based Practice Descriptions”
   a. Review the information to ensure the EBP is relevant to your targeted area and student characteristics.
   b. Scroll down to “Where is the best place to find out how to do this practice?”
      i. Use the provided lesson starters to write your EBP Action Plan Preparation, Training, and Implementation Checklists.
      ii. OR locate an original article by following the “Locating Original Articles” task analysis.
iii. Use the procedures outlined in the Method section of the article to write your EBP Action Plan Preparation, Training, and Implementation Checklists.

**Using What Works Clearinghouse (WWC)**

ies.ed.gov

1. Under the “Featured” tab at the top of the homepage, click on “What Works Clearinghouse.”
2. Click the “Find What Works!” tab at the top of the page.
3. On the left-hand side of the page, click the box next to the relevant Topic/Outcome Domain.
4. Click on the appropriate link to “Jump to findings for” the relevant target area.
5. Select and click on an intervention link.
   a. Avoid interventions with ® or™, as these are typically packaged programs that must be purchased from the publisher.
   b. If under the title “Effectiveness” on the EBPs summary it states that the intervention has potential negative effects for your target area, do not use that intervention.
6. Click on “Download Full Report.”
7. Review the WWC Intervention Report for the EBP.
8. If possible, use the descriptions in the research findings to create the implementation fidelity checklist.
9. If the implementation steps cannot be discerned from the summary, scroll down to “References” and select a study that meets WWC evidence standards with or without reservations.
   a. Do not select a select that did not meet WWC standards or evidence screens.
10. Locate the original article following the “Locating Original Articles” task analysis.
11. Use the procedures outlined in the Method section of the article to write your EBP Action Plan Preparation, Training, and Implementation Checklists.

**Locating Original Articles**

library.osu.edu

1. Under “Links” on the right-hand side of the page, click “Off-campus Sign-In.”
2. Enter your information to sign-in off-campus.
3. Paste the title of the article in the search bar and click “Search.”
4. Verify the title and authors of the article.
5. Click “View Now,” then “View full text,” then click on the link to the Full Text (PDF).
6. Skim the article and scroll to the Methods section to locate the procedures used, and check for any appendices at the end of the article.
7. Use the procedures and appendices to write your EBP Action Plan Preparation, Training, and Implementation Checklists
APPENDIX H: EBP ACTION PLAN RATIONALE
Overview & Rationale

- “It is critical that we train educators how to select and implement EBPs within their classrooms of students with a diverse set of needs.” (Marder & deBettencourt, 2015)
- Teacher preparation programs are in a unique position to tackle the research-to-practice gap in that they can equip new teachers not only with the skills necessary to engage in evidence-based practice (EBP), but with an appreciation for teaching as a scientific endeavor (Jones, 2009).
- There is a pertinent need for increased skill among teachers in problem solving and data-based decision making (Albritton & Truscott, 2014).
- EBP is a problem-solving framework in which special education teachers should be trained. It is a recursive process through which academic and behavioral student problems are pinpointed, scientifically supported technologies are selected, adapted, and implemented, and student progress is monitored. Educators and researchers involved in teacher preparation and professional development are faced with a formidable task in training teachers to engage in EBP. Exposure to technologies is insufficient in preparing teachers to implement them in the classroom (Gable et al., 2012). With limited empirical knowledge, methods for best facilitating acquisition, fluency, maintenance, and generalization of EBP skills remain uncertain. One promising approach may be coaching.
- Results from the present study may contribute to the development of a promising training model for adoption by teacher preparation programs. This study will attempt to extend the existing literature on coaching by using it to improve student teachers’ fidelity with the initial problem-solving steps of EBP. Specifically, student teachers will be coached to achieve high levels of fidelity in the pinpointing of problems (i.e., behavioral objectives), selection of empirically supported interventions, and adaptation of procedures to address simulated and actual classroom scenarios. Additionally, the relationship between coaching on EBP and student outcome measures will be examined.
- The following research questions will be addressed:
  1. What are the effects of coaching on special education student teachers’ fidelity with EBP to solve simulated classroom scenarios?
  2. What are the effects of coaching on special education student teachers’ fidelity with EBP to solve actual classroom scenarios?
  3. To what extent do teacher-collected student data suggest improved student outcomes?
  4. Are the goals, procedures, and outcomes of coaching considered to be socially valid by relevant stakeholders (i.e., student teachers and mentors)?
References


APPENDIX I: EXPERIMENTAL CONDITIONS PROCEDURAL CHECKLISTS
## Procedural Checklist: Baseline Sessions

<table>
<thead>
<tr>
<th>Step</th>
<th>1. Materials are present (computer with internet access, pen, paper).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Coach gives teacher a randomly assigned scenario and a blank sheet of paper.</td>
</tr>
<tr>
<td></td>
<td>3. Coach tells teacher, “Please read this scenario, identify the problem, and write an action plan of how you would address the issue.”</td>
</tr>
<tr>
<td></td>
<td>4. Coach records start/stop time.</td>
</tr>
<tr>
<td></td>
<td>5. If the teacher asks any questions, the coach replies, “Do your best.”</td>
</tr>
<tr>
<td></td>
<td>6. For an actual scenario probe, coach tells teacher, “Please identify an actual scenario in your classroom, identify the problem, and write an action plan of how you could address the issue.”</td>
</tr>
<tr>
<td></td>
<td>7. Coach records start/stop time.</td>
</tr>
</tbody>
</table>

| Data collector: | Participant: | Date: | Duration: |
Procedural Checklist: Initial Coaching Session

<table>
<thead>
<tr>
<th>Step</th>
<th>Procedures</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Coach provides teacher with training packet and jumpdrive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Coach discusses theory/rationale for engaging in EBP.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Coach reviews EBP Action Plan form and instructions for completing it.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Coach reviews example and nonexample of implementation checklists.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Coach reviews and models following the instructions for using the Web Sources and for Locating Original Articles.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Coach models how to complete the EBP Action Plan form with a random simulated scenario.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Coach gives teacher random simulated scenario and says, “Please identify the problem in this scenario and write an EBP Action Plan. I will help and give you feedback as you complete each step.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Coach provides praise and corrective feedback as the teacher completes each step of the EBP Action Plan.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Coach answers any questions the teacher has.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Procedural Checklist: Coaching Sessions

<table>
<thead>
<tr>
<th>Data collector</th>
<th>Participant</th>
<th>Date</th>
<th>Duration</th>
</tr>
</thead>
</table>

**Procedures**

<table>
<thead>
<tr>
<th>Step</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Coach begins with a specific, positive statement of what the teacher did well.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Coach reviews the scenario from the previous session.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Coach asks teacher his/her opinions of the EBP Action Plan; what he/she feels is working and what is challenging.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Coach reviews the teacher’s completed EBP Action Plan and each scored item on the Coding Form.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Coach praises each step the teacher completed correctly.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. For each item on the coding sheet the teacher did not perform correctly, the coach provides feedback and models how to correctly address that element of the EBP Action Plan.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Coach tells teacher total score/percentage; reminds teacher after 3 consecutive sessions at &gt;90%, practice with simulated scenarios will be terminated.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Coach asks teacher if s/he has any questions and, if so, answers them.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Materials are present (computer with internet access, pen, paper).</td>
<td></td>
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</tr>
<tr>
<td>10. Coach gives teacher a randomly assigned scenario.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Coach tells teacher, “Please read this scenario, identify the problem, and write an action plan of how you would address the issue.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Coach records start time.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. If the teacher asks any questions, the coach replies, “Do your best.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. For an actual scenario probe, coach tells teacher, “Please identify an actual scenario in your classroom, identify the problem, and write an action plan of how you could address the issue.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Coach records stop time.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX J: SOCIAL VALIDITY SURVEY
<table>
<thead>
<tr>
<th>Ranked Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. As a special educator, I believe it is important to engage in evidence-based practice (EBP) as a problem-solving process.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Prior to participating in this study, I had been explicitly taught problem-solving skills for addressing academic and social issues in the classroom.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. I believe it is important for special educators to use research-based interventions to help their students succeed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td><strong>Procedures</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. I enjoyed the practice using the EBP problem-solving process with simulated scenarios.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. I enjoyed being coached on my application of the EBP problem-solving process with simulated scenarios.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. I enjoyed using the EBP problem-solving process with an actual classroom scenario.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. I enjoyed being coached on my application of the EBP problem-solving process with an actual classroom scenario.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8. The use of simulated scenarios was necessary in my acquisition of the EBP problem-solving skills.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9. I would have preferred to focus only on actual classroom scenarios relevant to my particular teaching situation.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
10. The websites were teacher-friendly.
11. The task analyses helped me navigate the websites.
12. Once identified from a website, it was easy to create an implementation checklist for a selected practice.

**Outcomes**

13. I feel confident in my ability to use the EBP-problem solving process to address classroom issues.
14. I will use the EBP problem-solving process to address classroom issues in the future.
15. I think that teacher preparation programs and/or professional development opportunities for special educators should include coaching on the EBP problem-solving process.

**Open-Ended Items**

16. Please write any comments related to the goals (improving teachers’ fidelity engaging in EBP as a problem-solving process) of this study.
17. Please write any comments related to the procedures (coaching on EBP as a problem-solving process) of this study.
18. Please write any comments related to the outcomes (your ability to engage in EBP as a problem-solving process) of this study.
APPENDIX K: EST ORIGINAL ARTICLES
Original Article Used by Participants


-Source/EST: www.nsttac.org/video modeling +community instruction

-Used by Sebastian for Simulated Scenario #1


-Source/EST: autism.pdc.fpg.unc.edu/task analysis

-Used by Sebastian for Simulated Scenarios #9 and #10


- Source/EST: www.nsttac.org/Self-monitoring

-Used by Marissa for Simulated Scenario #15 and Actual Scenario


-Source/EST: NSTTAC/Social skills training

-Used by Marissa on Simulated Scenario #3


-Source/EST: WWC/Spelling Mastery

-Used by Joy on Simulated Scenario #13


-Source/EBP: WWC/Positive Action

-Used by Sebastian for Simulated Scenarios #3 and #4

- Source/EST: Classwide Peer Tutoring/BEE
- Used by Joy for Simulated Scenario #7


- Source/EST: www.nsttac.org/Mnemonic devices
- Used by Joy and Sebastian for Simulated Scenario #12


- Source/EST: www.nsttac.org/behavioral skills training
- Used by Joy and Sophie for Simulated Scenario #2


- Source/EST: WWC/Repeated readings
- Used by Marissa on Simulated Scenario #9