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Role of Professional Development and Multi-Level Coaching in Promoting Evidence-Based Practice in Education

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Professional development through in-service training may not be of sufficient duration, intensity, and specificity to improve teachers' instructional skills. Due to the increased need to support teachers' use of evidence-based practices in multi-tiered systems of support such as RTI and PBIS, coaching can extend and strengthen professional development. This paper describes a multi-level approach to coaching, and provides implications for practice and research.

Keywords: **Coaching, evidence-based practices, professional development.**

Introduction

Increasing student academic achievement has been at the forefront of various educational mandates for decades. At the turn of the millennium, the No Child Left Behind (NCLB, 2002) legislation placed an emphasis on increasing academic standards in an effort to improve student academic achievement. The focus was not only what to teach students (e.g., critical components of beginning reading), but how to teach students (e.g., research-based practices). New terms, such as *scientifically based research,* emerged to indicate that methods used to teach core content to students required research support. NCLB required that teachers be *highly qualified* in their content areas and also focused on *accountability* by holding districts and schools accountable for students' academic growth. At the same time, the National Research Council (NRC) published a report about the use of research in education, emphasizing that all modes of research are important to education (NRC, 2002). Most importantly, and for the first time, the significance of educational research was realized and mandated through legislation.

Following NCLB, the reauthorization of the Individuals with Disabilities Education Act (IDEA, 2004) underscored the importance of research in education. One notable change in IDEA was the shift in methods used to qualify a student with a learning disability. States could now replace the criteria for a discrepancy between

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a student's ability and achievement scores with a process to monitor a student's response to receiving scientific, research-based interventions. This new process became known as Response to Intervention (RTI), an innovative approach to prevention and remediation.

At its core, RTI is a multi-tiered system of support that provides a framework for effective research-based instruction at varying levels of intensity including student progress monitoring, data-based decision making, and an alternative route for identifying students with learning disabilities (Fletcher & Vaughn, 2009; National Center on Response to Intervention, 2010). Most RTI models include three tiers of intervention that increase with an intensity: primary level (Tier 1), secondary level (Tier 2), and tertiary level (Tier 3; Fletcher & Vaughn, 2009; National Center on Response to Intervention, 2010). Evidence-based practices (EBPs) serve as the foundation for each tier; however, teachers may find it difficult to identify and evaluate the quality of these practices.

Various research groups have created sets of quality indicators for determining the extent to which specific interventions or practices should be considered evidence based (Cook et al., 2014; Gersten et al., 2005; Horner et al., 2005). Specific criteria are used to evaluate quality of design, implementation, results, and replication of results of quantitative research methods (Cook et al., 2014; Gersten et al., 2005; Horner et al., 2005). Educators can use these criteria to ensure the interventions they use can improve student achievement.

Despite the push to improve student achievement over the past two decades, students' average scores on the National Assessment of Educational Progress (NAEP, 2015) have remained below proficient in reading and mathematics. On the most recent NAEP reading assessment, only 36% of fourth grade students and 34% of eighth grade students scored at the proficient level (NAEP, 2015). In mathematics, 40% of fourth grade students and 33% of eighth grade students scored at the proficient level (NAEP, 2015). Because of these and similar results, EBPs are necessary to ensure that students are taught using methods that have demonstrated effects.

More recently, with the passing of Every Student Succeeds Act (ESSA, 2015), the successor to NCLB, new legislation continues to support the need for EBPs. In this mandate, grants are awarded under the *Investing in Innovation* program to fund research on effective educational strategies. As an incentive for using rigorous research standards, the more rigorous the research behind the strategy, the more funding could potentially be awarded (ESSA, 2015). These promising efforts promote necessary use of EBPs to improve student achievement.

Research has shown that teachers want to improve their instruction to support students at risk or with disabilities (Bursuck, Munk, Nelson, & Curran, 2002; Williams & Coles, 2007); however, many teachers, especially general educators using an RTI model, may feel unprepared due to: (a) lack of pre-service preparation in specific interventions (Brownell, Ross, Colon, & McCallum, 2005), (b) lack of general education curricula featuring instructional design that supports students at risk or with disabilities (Coyne, Kame'enui, & Carnine, 2011), and (c) lack of professional development to meet the needs of struggling students (Boardman, Arguelles, & Vaughn, 2005). Multi-level coaching following high-quality professional development can be used to support teachers' use of EBPs within multi-tiered systems of support such

as RTI or Positive Behavior Interventions and Support (PBIS). The purpose of this article is to discuss the limitations of professional development, describe multi-level coaching as an extension of professional development, and provide implications for practice and research on multi-level coaching as a tool to leverage change in teachers' use of evidence-based practices in the classroom.

Limitations of Professional Development for In-service Teachers

Despite attention paid to evidence-based practices, a gap between research evidence and classroom practice in both general and special education classrooms exists (Cook & Schirmer, 2006; Denton, Vaughn, & Fletcher, 2003). Research- and evidence-based teaching practices have had minimal, if any, carryover into classrooms (Burns & Ysseldyke, 2009; Cook & Schirmer, 2003; Fuchs & Fuchs, 2001). Denton et al. (2003) suggest two reasons for this documented gap between research and practice including: (a) lack of information and knowledge of implementation and (b) disbelief that practices are associated with improved outcomes for students. While schools and colleges of education should, at a minimum, provide foundational knowledge on effective instructional methods, professional development can be used to foster teachers' skill development and keep them abreast of current research (Walsh, Glaser, & Wilcox, 2006).

Professional development can give educators additional knowledge and skills to use research-based practices. Unfortunately, many teachers have limited access to quality professional development opportunities on strategies to meet the needs of all students in the classroom (Boardman et al., 2005). Professional development is most often a one-day in-service or workshop; however, this method often produces little improvement in teacher performance (Desimone, Porter, Garet, Yoon, & Birman, 2002; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Furthermore, teachers are provided little opportunity to practice newly learned skills and often receive no feedback on performance. Boardman et al. (2005) conducted focus groups with special education teachers to identify perspectives related to use of research-based practices and professional development. Teachers reported they were "neither obligated to nor impressed by the current push to use research-based practices in their classrooms" (p. 177). Teachers also indicated frustration with professional development, which often did not match their students' needs and lacked sufficient support in aiding them in selecting and implementing practices.

Despite its limitations, professional development can leverage teachers' use of evidence-based instructional practices. Based on literature regarding effective professional development, Leko and Brownell (2009) suggest professional development be coherent, content-focused, active, and collaborative. According to NCLB (2002), high quality professional development: (a) is sustained, intensive, and content focused; (b) is aligned with academic standards and assessments; (c) improves teacher content knowledge; (d) improves teachers' use of evidence-based instructional methods; and (e) is evaluated for student and teacher effects. High-quality professional development encompassed with demonstration, practice, and coaching increases teachers' knowledge, skills, and application (Joyce & Showers, 2002). Without this, professional development often results in "fragmented, ineffectual attempts to correct surface issues" (Boardman et al., 2005, p. 177). Additionally, the opportunity

to practice learned strategies and methods with immediate feedback during professional development experiences provides teachers the confidence to apply learned strategies in the classroom (Nichols et al., 2006).

Multi-level Coaching as an Extension of Professional Development

While in-service training alone may be sufficient to help teachers use newly learned strategies with fidelity, for some teachers, additional leverage and support is necessary. Specifically, professional development that includes a combination of in-service and follow-up support in the form of coaching has shown promise in promoting changes in teacher behavior (Garbacz, Lannie, Jeffery-Pearsall, & Truckenmiller, 2015; Jager, Reezigt, & Creemers, 2002; Knight, 2009; Kretlow & Bartholomew, 2010; Kretlow, Wood, & Cooke, 2011; Yoon et al., 2007). The purpose of coaching is to provide individualized support to teachers following an initial in-service or training in an effort to support teachers' use of new instructional skills (Helf & Cooke, 2011; Kretlow & Bartholomew, 2010). Figure 1 shows features of effective professional development and coaching.

Figure 1. **Features of effective professional development and coaching.**

Professional Development Effective features based on recommendations from Showers, Joyce, and Bennett (1987) and NCLB (2002)	**Coaching** Effective features based on recommendations from Kretlow and Bartholomew (2010) and Garbacz et al. (2015)
• Grounded in theory • Aligned to standards and assessment • Provides demonstration and opportunities for practice • Provides feedback as teachers practice • Is sustained, intensive, and focused • Improves teachers' content knowledge Improves teachers' use of EBPs • Evaluated for teacher and student effects	• Involves experienced coaches • Involves various structures (e.g., behavioral consultation, instructional coaching) • Involves various forms (e.g., supervisory, side-by-side) • Provides direct observation and feedback based on implementation-fidelity tools • Provides modeling with opportunities to practice • Uses problem solving, goal setting, and data-based decision-making

Coaches often have a deep understanding of instructional practices and can help leverage teachers' use of these practices. Raney and Robbins (1989) stated, "coaching provides teachers a means of examining and reflecting on what they do in a psychologically safe environment where it is all right to experiment, fail, revise, and try again" (p. 37). Coaching has been demonstrated to be effective for: (a) improving academic instruction (Fisher, Frey, & Lapp, 2011; Menzies, Mahdavi, & Lewis, 2008; Rudd, Lambert, Satterwhite, & Smith, 2009), (b) supporting implementation of new-

ly learned strategies (Bethune & Wood, 2013; Kretlow et al., 2011; Tschannen-Moran & McMaster, 2009), (c) increasing teachers' fidelity of implementation of trained strategies (Menzies et al., 2008), and (d) increasing student achievement (Fisher et al., 2011; Powell, Diamond, Burchinal, & Koehler, 2010). In addition, research indicates teachers place greater value on coaching compared to traditional professional development (Blakely, 2001).

In a comprehensive literature review, Kretlow and Bartholomew (2010) examined the impact of coaching on preservice and in-service teachers' fidelity of implementation of evidence-based practices in the classroom setting. Authors identified 13 studies for inclusion and all demonstrated coaching led to improvements in instructional fidelity. Studies included in the review used two types of coaching: supervisory and side-by-side. Additionally, six of the studies reported student outcome variables (i.e., academic engagement, on-task behavior), and two of the studies examined academic outcomes (i.e., spelling test performance, teacher- and district-created literacy measures). To support teachers in implementing practices deemed effective through research, coaches frequently engage in observation, modeling, and feedback. Two frequently used models are supervisory coaching and side-by-side coaching (Kretlow & Bartholomew, 2010).

Supervisory coaching. Supervisory coaching occurs when a coach observes a teacher implementing a new strategy, records data on implementation of desired behaviors, and provides targeted feedback on strengths and opportunities for improvement following the lesson (Kretlow & Bartholomew, 2010). Research has shown supervisory coaching is effective for improving academic instruction (Fisher et al., 2011; Menzies et al., 2008; Morgan, Menlove, Salzberg, & Hudson, 1994; Rudd et al., 2009), increasing teachers' fidelity of implementation of trained strategies (Kohler, Crilley, Shearer, & Good, 1997; Menzies et al., 2008), and increasing student achievement (Fisher et al., 2011; Menzies et al., 2008; Powell et al., 2010). Supervisory coaching, often delivered by school personnel such as literacy specialists, can be effective for many teachers; however, this method does not provide in vivo feedback for teachers, a cornerstone of side-by-side coaching.

Side-by-side coaching. Side-by-side coaching occurs when the coach provides in vivo feedback specific to accuracy of implementation of identified teaching behaviors during a lesson with students (Kretlow & Bartholomew, 2010). The coach, typically another staff member, observes a teacher implementing a new strategy, intervenes during a lesson to model specific teaching behaviors, and then turns instruction over to the teacher to provide an opportunity to practice the same teaching behaviors with immediate feedback. A feedback meeting is then held to discuss strengths and opportunities for improvement. Research has shown that teacher training that includes follow-up support in the form of side-by-side coaching is effective for improving fidelity of implementation of academic instruction. Side-by-side coaching may be a critical professional development component necessary to support implementation of newly learned strategies (Kretlow et al., 2011; Tschannen-Moran & McMaster, 2009), and provision of hands-on workshops and side-by-side coaching should be directly tied to classroom practice (Bursuck et al., 2004).

Kretlow et al. (2011) examined effects of in-service support plus side-by-side coaching on three kindergarten teachers' accurate delivery of group instruction-

al units during 10-min calendar math segments. Teachers had experience teaching Direct Instruction (DI) programs (i.e., Reading Mastery), which employ strategies similar to those used during in-service training (i.e., choral responding, model-lead-test, response cards, systematic error correction). Teachers received a 3-hr group in-service followed by one individual preconference, side-by-side coaching session, and feedback session. Using a multiple baseline across teachers design, results indicated teachers' percentage of correctly implemented group instructional units increased from baseline to post in-service, then increased again and maintained at a high level following individual side-by-side coaching sessions. The authors indicated side-by-side coaching is likely a critical component of professional development in order to support implementation of newly learned strategies. Authors also suggested that future research investigate effects of in-service and coaching with general education teachers who do not have training in DI programs or strategies to examine effectiveness in a more typical general education classroom situation.

In a systematic replication, Kretlow, Cooke, and Wood (2012) investigated effects of in-service and side-by-side coaching on three first-grade teachers' implementation of research-based strategies (i.e., model-lead-test, systematic error correction, unison responding) during calendar math instruction. A generalization measure was obtained during an untrained area of math (i.e., numeracy and problem solving). All teachers included in the study had taught a DI reading program for at least 1 year. Teachers participated in a 3-hr in-service, and each received individual side-by-side coaching during calendar instruction. Using a multiple baseline across teachers design, results indicated side-by-side coaching was effective in increasing and maintaining teachers' instructional performance during math lessons and generalizing their performance to other math lessons. Authors recommended that future research examine the relationship between teachers' implementation of strategies and student achievement.

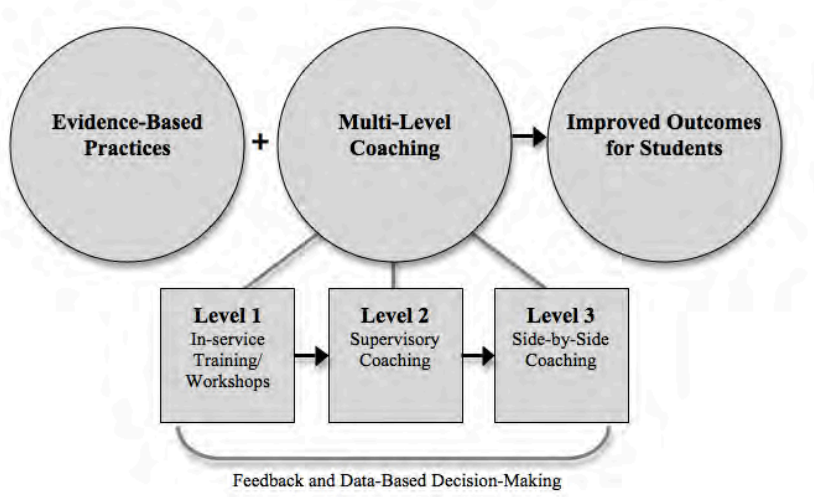
Side-by-side coaching has also been used to support teachers of students with challenging behaviors. For example, Bethune and Wood (2013) examined the effects of coaching on teachers' accuracy of implementation of function-based interventions and the effects of those interventions on student behavior. They used a concurrent, delayed multiple baseline across participants (teachers) design to measure the effects of side-by-side coaching on teachers' use of function-based interventions with students with severe disabilities and problem behavior. Additionally, they used a multiple baseline across participants (students) design to determine the effects of the function-based interventions on students' problem and replacement behaviors. A functional relationship was demonstrated in that teachers' accuracy of implementation of the function-based interventions increased after implementation of the coaching. Regarding student behavior, some student problem behavior improved upon teachers' inaccurate implementation of the function-based intervention (i.e., pre-coaching), while other students required accurate implementation of the function-based intervention (i.e., post-coaching) in order for their problem behavior to decrease. There was a functional relationship between accurate implementation of the function-based intervention (i.e., post-coaching) and students' increase in their primary replacement behaviors. A primary limitation was the fact that the coach was

an outside expert, which may pose sustainability concerns for school districts hoping to implement this model.

In another study, Bethune (in press) examined the effects of coaching on teachers' implementation of Tier One School-Wide Positive Behavioral Interventions and Supports (SWPBIS) in their elementary general education classrooms. A multiple baseline across participants design was used, and data demonstrated a functional relationship between the implementation of side-by-side coaching, by the school's instructional coach, and an increase in fidelity of implementation of the school's Tier One SWPBIS procedures. Teachers' data were variable throughout the study and appeared related to student behavior (e.g., during observations where students presented more opportunities for teachers to implement error correction procedures, the teachers scored with lower accuracy than on days when students presented with more opportunities for reinforcement procedures). A secondary data analysis indicated that office referrals by teacher participants decreased in the two months after implementation of coaching as compared to the two months prior to coaching; however, it was unclear if these data reflect a change in teacher behavior (i.e., more accurate implementation of referral procedures) or student data (i.e., less severe problem behavior demonstrated by students). The study demonstrated that it might be possible for school districts to use current employees to fulfill the role of the SWPBIS coach.

Multi-level coaching. Similar to the framework of multi-tiered supports for students (e.g., RTI), multi-level coaching is a process that includes: (a) high-quality professional development, (b) follow-up supervisory coaching, and (c) side-by-side coaching for teachers who demonstrate the need for additional support (Schnorr, 2013). Direct measures of teacher performance and data-based decision making are used to support movement among the levels of support. Figure 2 provides an overview of multi-level coaching.

Figure 2. **Multi-level coaching.**



Schnorr (2013) provided empirical evidence for multi-level coaching as an extension of professional development to support teachers' acquisition of new skills. This study investigated the effects of multi-level support on nine first-grade teachers' use of research-based strategies during beginning reading instruction. All nine teachers participated in a small group, half-day in-service (i.e., 3-hr). During the in-service, teachers were trained to use choral responding, response cards, model-lead-test, and systematic error correction within the district selected core reading program, *Imagine It!* (Bereiter et al., 2008).

In Schnorr's (2013) study, multi-level support was provided based on an RTI delivery approach with three levels of intervention, thereby systematically increasing the level of support provided to teachers. The researcher served as the coach across all levels of support. Level 1 support (i.e., in-service) was provided to all teachers simultaneously. Level 2 support (i.e., supervisory coaching) was staggered systematically across identified teachers, while data were simultaneously collected on percentage of correctly implemented group instructional units. This second level of support was introduced based on whether or not teachers met mastery criterion (≥80% on final three data points). Teachers who did not require Level 2 support entered maintenance once mastery criterion was met and did not receive any additional follow-up support unless their scores fell below a mean of 80% accuracy. Level 3 support (i.e., side-by-side coaching) would be provided to teachers who did not meet mastery criterion in Level 2 (i.e., supervisory coaching). Introduction of Level 3 support would have been staggered; however, no teachers in the study required this intensive level of support.

Using a multiple baseline across teachers design, results of this study demonstrated that for the three of nine teachers requiring Level 2 follow-up support in the form of supervisory coaching, changes in teachers' instruction occurred following a 3-hr in-service and only one supervisory coaching session (i.e., observation and feedback meeting). The remaining six teachers demonstrated improved instruction following Level 1 support (i.e., in-service). Overall, teachers requiring follow-up support engaged in fewer than 4 contact hrs, while remaining teachers made substantial changes to instruction following only 3 contact hrs (i.e., group in-service).

Results of this study demonstrated that not all teachers required follow-up support in the form of coaching and that supervisory coaching was implemented in a brief period of time, yet produced positive changes in teaching behaviors. These results align with previous research and suggest professional development be directly tied to classroom practice and include demonstrations and opportunities for practice, as well as follow-up support in the form of coaching (Bursuck et al., 2004; Kretlow et al., 2011; Kretlow et al., 2012). Results also suggest that follow-up support could be multi-leveled to meet the varying needs and abilities of teachers, rather than providing a "one size fits all" approach for all teachers (Myers, Simonsen, & Sugai, 2011).

Implications for Practice

Professional development (e.g., one-day workshop) may not be of sufficient duration, intensity, and specificity to improve teachers' instructional skills. School administrators might consider adopting a multi-level support model in order to provide teachers additional individualized support by an on-site coach following an initial professional development activity. Districts may be able to use support specialists

(e.g., curriculum specialists, program specialists) and schools may be able to use on-site personnel including the literacy facilitator, or highly effective general or special education teachers (peers) as coaches. Focus could then be on those teachers who need follow-up support instead of providing the same support for all teachers across all professional development activities.

Implications for Future Research

Future research on multi-level coaching can address several areas. Since many studies relied on an experimenter-as-coach (Bethune & Wood, 2013; Kretlow et al., 2012), studies should use school personnel as coaches when examining the effects of in-service and coaching (Bethune, in press). Next, more research that uses direct measures of teacher and student performance is needed (Greer, 1994; Kretlow et al., 2011; Kretlow et al., 2012). Compared to subjective measures, such as rating scales or anecdotal notes, direct and objective measures that "capture the interactive relationship between teachers' instruction and students' responses during whole-group lessons" (Kretlow et al., 2011, p. 236) are more sensitive to changes in performance and strengthen data-based decision-making. Some studies on professional development and coaching have included measures of generalization and maintenance (Bethune & Wood, 2013; Kretlow et al., 2012; Schnorr, 2013); however, more research is needed to evaluate the effects of multi-level coaching on teachers' and students' generalized performance during non-coached instructional times (e.g., coached during reading lessons and generalization measured during math lessons). Data on long-term maintenance of teacher and student performance are also needed to strengthen the research base on professional development and coaching.

Summary

This article discussed the limitations of professional development, described multi-level coaching, and provided implications for practice and research. Since EBPs in education have become a focus (NCLB, 2002; ESSA, 2015) clarity has been provided in the development of criteria for EBPs (Cook et al., 2014; Gersten et al., 2005; Horner et al., 2005) and the development of multi-tiered frameworks for intervention (Fletcher & Vaughn, 2009). However, teacher implementation of EBPs in instruction remains a concern (Burns & Ysseldyke, 2009; Cook & Schirmer, 2006; Denton et al., 2003; Fuchs & Fuchs, 2001). Quality professional development with multi-level coaching (i.e., supervisory, side-by-side) can support teachers' use of EBPs and can be used as a leverage to increase the use of EBPs in classrooms, ultimately impacting student outcomes (Bursuck et al., 2004; Schnorr, 2013). Adopting a multi-level professional development model that involves coaching may address the needs of individual teachers while providing support to teachers who may require assistance in effectively implementing EBPs.

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