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Instructional Coaching:

Key Themes from the Literature

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Introduction

In recent years, several large districts – New York, Los Angeles, Philadelphia, Denver, Boston, and Providence among them – have created "coach" roles to support local implementation of reforms and curricula. Similarly, many reform model providers – e.g., America's Choice (Poglinco, et al., 2003), High Performing Learning Communities (Geiser & Berman, 2000), and Breaking Ranks (National Association of Secondary School Principals, 1996) – increasingly rely on coaches to advise, urge, interpret, and support reform implementation. Why is coaching prevalent? What does this role entail in practice?

Literature on educational coaching is beginning to emerge (e.g., Ai & Rivera, 2003; Neufeld & Roper, 2003; Poglinco, et al., 2003; Rust & Freidus, 2001; West & Staub, 2003) along with coaching literature from business and management (e.g., Smither & Reilly, 2001). Coaching as a phenomenon addresses problems consistently identified in the research literature: Research repeatedly shows that reforms are not self-implementing (Cuban, 1990; Sarason, 1990) nor do they penetrate predictably or frequently into the "instructional core" of the classroom (Elmore, Peterson, & McCarthy, 1996). To bring about local implementation, the reasoning goes, educators need high quality professional development. As defined by research and professional consensus, high quality professional development is sustained, relevant, actively engaging, standards-based, and focused on practice (Garet, et al., 2001; National Partnership for Excellence and Accountability in Teaching, n.d.; U.S. Department of Education, 1999). The common term for this – "job-embedded professional development" –- suggests that local learning requires structures and practices that are built into the on-going work of educators. Coaching seems to offer just this sort of support.

Though growing in popularity, the "coach" role is highly variable across individuals and settings. As researchers of America's Choice have noted, "There does not appear to be one 'official' written job description for coaches that is shared by all America's Choice schools" (Poglinco, et al., 2003, p. 9). Indeed if the coach role lacks definition even within a defined reform model, it should not be surprising that it is variously interpreted and differently structured by other educators. Some coaches are "school coaches" who work to support whole-school improvement (Brown et al., 2005); others are "instructional coaches" who work to help teachers refine and enhance their classroom practice. Some coaches are externally-based, working for regional support centers, school reform model developers, or as independent consultants. Other coaches are employed by their own districts, and have additional roles, such as lead teacher or curriculum specialist. In some sites, coaches are the primary strategy for delivering professional development; in other sites, coaches are one element of a multi-faceted professional development strategy (Guskey, 1995). Some coaches operate from a framework of transferring expertise. Other coaches chafe at the premise of coach as expert and instead identify their task as facilitating collegial reflection and improvement processes. Though there is considerable overlap between instructional coaches and school-change coaches, there is considerable variability in both roles emerging from research and practice.

Methodology

The Education Alliance at Brown University, working in partnership with Hezel Associates, produced this literature review on instructional coaching to serve as resource to the TeacherLine Design Team. Given a limited time frame and budget, the Education Alliance offers the following scan and synthesis of key themes from the literature on instructional coaching. The following synthesis is more modest in scope than a comprehensive literature review. It addresses several salient questions about instructional coaches, looking across a variety of research studies and practitioner accounts.

To gather literature for this review, the Education Alliance at Brown University used key words to search electronic databases, specifically Academic Search Premier, ERIC, and Google Scholar, as well as conducting archive searches of practitioner publications such as *Education Week.* Key words included:
- Instructional coaches/coaching
- Mathematics coaches/coaching
- Reading/literacy coaches/coaching
- Technology coaches/coaches and technology

Once a preliminary set of articles was identified, the evaluation team then read each article's reference list to identify additional citations of interest. The evaluators additionally collected coaches' published journal entries from the Teacher Leaders Network (www.teacherleaders.org) and identified coaching job descriptions from a variety of district websites.

Instructional coaching has not generated a vast body of research at this point in time. For this reason, the evaluation team did not set strict criteria for excluding research from review. The evaluation team looked for a wide variety of research methodologies as well as descriptive accounts from practitioner journals, professional organizations, and district websites. The search strategies yielded approximately 40 studies dealing with some aspect of instructional coaching.

Though the research on instructional coaching is relatively bounded, there is nonetheless a much wider body of research with direct relevance to instructional coaching. Instructional coaching grows out of several trends that have been surfacing in research and practice over the past two decades. These trends include an emphasis on professional collaboration, job-embedded professional development, and differentiated roles for teachers. Thus, the evaluation team and the Design Team might, in the future, cast a much wider net to gather related research literature. The research on teacher learning, teacher collaboration, teacher career trajectories, and high quality professional development can all shed powerful light on particular aspects of instructional coaching.

Nonetheless, the evaluation team confined its search to instructional coaching in K-12 settings largely in the United States. There is a potentially relevant body of literature on coaching in other organizational settings, coaching in international settings, as well as

athletic coaching, that were not reviewed. Finally, the evaluation team did not delve into the research on school change coaching or data coaching given limitations of time and resources. Again, these are likely relevant and useful to understanding the full range of issues associated with instructional coaching, but were not included in the present review.

To analyze the literature on instructional coaching, the evaluation team, with feedback from the Design Team, framed a series of questions on instructional coaching. These questions guided both the analysis of the research and its presentation in this report. The questions are as follows:
1. How do differing theories shape the work of coaches?
2. What do instructional coaches do? What are their primary tasks and activities?
3. How is coaches' work structured?
4. What kinds of knowledge, skills, and dispositions do coaches need to do their job?
5. What kinds of professional development and collaborative opportunities are available to coaches?

The evaluation team looked across the research studies to address these questions. In some cases, there was considerably less information available than with other questions. Finally, the report concludes by characterizing the current state of research on instructional coaching, noting that there is not yet a robust and nuanced set of findings available to answer important questions about the effectiveness of coaching writ large or the relative effectiveness of particular elements of coaching.

1. How do differing theories shape the work of coaches?

Coaching activities vary, and so do the theories that underlie them. Though it is beyond the scope of this review to do adequate justice to the full suite of theories about adult learning, there are a few salient theoretical frames that emerge in the coaching literature. In general, several research studies represent coaching as a fully consultative exchange, where knowledge is co-constructed by professional equals. Other literature situates coaching in the more behaviorist domain of knowledge transfer from expert to novice. Some of the literature further suggests that teacher practice changes when teachers' shift their beliefs; other literature suggests the converse: Teacher beliefs change after they see concrete changes in their classroom environments.

Costa and Garmston's (1994) model of cognitive coaching proposes teachers' thought processes and beliefs determine their instructional behavior. According to the cognitive coaching model, in order to effect changes in practice, instructional coaching should focus on eliciting and examining the thoughts and decisions that a teacher makes in the context of teaching. Coaching, then, is organized around a theory of cognitive apprenticeship (Collins, Brown, &Newman, 1989; Dennen, 2004). The focus of the expert/novice interaction in a cognitive apprenticeship is on developing cognitive skills of reflection through discourse and application of knowledge.

An alternative theory of instructional coaching is described by Veenman and Denessen (2001) as one that draws upon theories of teacher change proposed by Guskey (1985). This model is grounded in the proposition that changes in practice are more likely to take place after positive student outcomes occur. Based on this view, instructional coaching should aim at enhancing teachers' practice that directly links to learning outcomes for students, as a prerequisite to changes in the beliefs and attitudes of teachers.

Theories of coaching have also been linked to differing functions. In one instance coaching can serve a more consultative function and in the other coaching can be more directive when confronting specific problems (Veenman & Denessen, 2001, p.397). Conferences initiated by a teacher are viewed as examples of the consulting function, where the expertise of the coach is sought to strengthen instructional competencies or address areas for professional growth. In this instance, consulting can be viewed as supplementing the teacher's own efforts toward self-improvement.

An example of the consulting function might be The Boston Plan for Excellence (BPE), which has served as a partner to the Boston Public Schools (BPS) in their school reform work. In the 2001-2002 school year, The BPE began piloting Collaborative Coaching and Learning (CCL) in Boston Public Schools as an intensive ongoing staff development program that aims to reduce professional isolation and to encourage a more collaborative culture (Neufeld, 2002). In the BPS model of coaching, the teacher, school leader and coach are described as engaging in a process of inquiry about instructional practices that support and improve student learning (Curtis, 2001).

The second model is evident when the coach initiates conferences, often via a directive from an administrator or a program. These examples represent a more prescriptive approach to coaching and are often used when confronting performance problems. In this case, a coach may focus on a particular instructional task to be performed at a satisfactory level.

Examples of coaching used to confront specific performance issues may include implementation of large-scale professional development efforts to support improvement goals in reading or mathematics programs. For instance, in Dallas, a program developed as part of a district reading plan was used to supplement salaries of literacy coaches at schools with low performance outcomes. The aim of the program was to remove all of the schools were from the low performance list, a goal reached after five years (Russo, 2004).

Across programs described in the literature, instructional coaching may fall at differing points along differing continua. The degree to which coaching is consultative or directive, collaborative or supervisory, focused on inquiry or teacher behavior, peer-to-peer or expert-to-novice have significant ramifications for research and practice. Again, these are not pure dichotomies, but differences in degree and kind. Some of the accounts in the literature explicitly situate instructional coaching within a given theory of learning or change, but many do not.

2. What do instructional coaches do? What are their primary tasks and activities?

The literature on coaching indicates that instructional coaches typically engage in a wide variety of activities and assume a number of roles (Hall, 2004; O'Connor & Ertmer, 2003; Richard, 2003). In a given setting, the typical coach provides one-on-one support in the classroom, but also might provide professional development to small groups of teachers as well as assist with school-wide curriculum or assessment efforts (Cress, 2003; Race, Ho, & Bower, 2002). Across settings, the coaching literature presents an array of activities that occur with varying degrees of frequency. Chart 1 summarizes the activities most frequently associated with instructional coaching.

Chart 1: Frequent coaching activities

Classroom-based activities with individual teachers	Classroom-focused activities with groups of educators
Demonstrating and modeling instructional practices and lessons	Conducting study groups
Observing instruction	Providing training and professional development workshops
Co-teaching	Organizing and brokering instructional materials
Co-planning lessons and units	Administering assessments and monitoring results
Providing feedback and consultation	Chairing or serving on school and district committees
Promoting reflection	
Analyzing students' work and progress	

The classroom activities of instructional coaches are described in an evaluation of professional development in Los Angeles during the 2002-03 school year (Rivera, Burley, & Sass, 2004). Coaching activities documented in the report included: classroom visitations, observations and demonstration lessons; teacher conferencing; developing and maintaining rapport with teachers and administrators; managing assessments and materials; and conducting training sessions. Researchers found that direct coach-teacher interactions were more likely to lead to changes in instructional practice than coaching in small group settings. They also found, however, that coaches were sometimes tasked with extraneous duties, such as paperwork, and clerical assignments, and this took significant time away from direct coach-teacher activities. Conversely, coaching that was ongoing and directly related to classroom instruction provided greater evidence of potential and actual improvement than did irregular interactions or activities directed at larger group meetings.

Neufeld and Roper (2003) describe a similar set of activities undertaken by content coaches who focus on helping teachers improve instruction in a specific discipline, such as literacy or mathematics. Specifically, these coaches conduct the following activities in

the classroom: work with teachers to plan and implement lessons; work with content teachers to hone specific strategies; develop and find materials and curriculum resources; work with new teachers; encourage teachers to talk about their practice with them and one another; observe classes and provide written and oral feedback; and provide demonstration lessons.

At the school level, content coaches help teachers develop leadership skills to support work with colleagues; provide small group professional development; conduct book purchases and inventories; help teachers develop classroom-based strategies for assessing student learning and make use of formative assessments; keep logs of their work with students; and meet with principals to review progress.

Similar coaching activities are described throughout the literature (Sturtevant, 2003), but considerable differences appear as well. Instructional coaching may be associated with a fixed set of activities within a given site, but the mix of activities varies between contexts and implementation approaches. At this point in time, there does not appear to be a normative, fixed definition of instructional coaching despite the fact that many write as if there were. In many of the reviewed articles, writers assume that the features and activities they describe as instructional coaching are widely shared and agreed upon. A more careful review of multiple accounts shows that although all coaches do work with teachers, there is considerable variability in strategies and activities.

3. How is coaches' work structured?

As discussed in the previous sections, instructional coaches can engage in a wide variety of activities framed by differing theories about the nature of their roles. This section of the review, however, discusses the different ways that the coaching role is structured in different implementation settings. Structural variations in the role – such as the amount of time allocated to coaching, voluntary versus mandated participation in coaching, and the organizational contexts in which coaching occurs – all surface as relevant distinctions throughout the literature.

Time: Structural differences related to time allocations appear in almost every account of coaching, whether by researchers or practitioners. Some coaches work in a split role, serving, for example, as part-time reading specialists providing direct service to students and as part-time coaches working with teachers. Even among full-time coaches, however, there is considerable variation in how their time is allocated. Some districts spread coaches between multiple schools, necessitating additional time for travel and orientation. Other districts assign a coach to a single school or grade-level (Albritton, 2002, 2003).

The most salient time allocation differences, however, arise from issues of "dosage," particularly with regard to duration and intensity of coach-teacher interactions. Many accounts in the literature are not explicit about exactly how often coaches work with whom over what period of time. Knight (2004a) and Guiney (2001) describe programs

where coaches meet with teachers once per week, but they do not specify the length or duration of time. Rivera, Burley, and Sass (2004) found that increased levels of direct coach-teacher interaction and ongoing engagement in coaching activities were strong predictors of instructional changes in the classroom. In general, however, there is little evidence available about coaching schedules, including the optimal amounts and durations of time.

The literature does discuss, however, the issue of scarce time with regard to coach-teacher lesson debriefing, curriculum planning, and post-observation conferences. Coaches and teachers seem to be able to collaborate during regularly scheduled class time with students present, but often struggle to find time for professional discussion. While many coaching models highlight the importance of fostering reflective practice, protected time for reflection remains scarce, whether due to teacher contracts, few unassigned teacher periods, or over-extended coaches.

Time, then, appears to shape the coaching role in several important ways. The schedule of the coaching rotation, its duration, and the school's daily schedule all surface in the literature as structural conditions that impact how coaching takes place in a given setting.

Voluntary versus mandatory participation in coaching
In several accounts, coaching is structured as a voluntary form of professional development (Knight, 2004a) whereas in other contexts, it is mandatory for particular groups of teachers. In several Reading First sites, for example, coaches work with all first- through third-grade teachers. Knight (2004a), by contrast, describes voluntary coaching as a central value and insists that coaches adopt a "partnership" mindset.

Voluntary versus mandatory coaching may not affect coaches' core activities (such as lesson demonstration or co-planning), but it does appear to influence the ways that coaches work and with whom. In the voluntary programs, coaches often had to work to build a clientele, informally "marketing" their services to teachers and gradually establishing collaborative interactions. Voluntary and mandatory coaching programs may also intersect with collegial peer coaching versus expert coaching models as discussed in previous sections.

Though not a structural condition of coaches' work, teacher resistance surfaced as a prevalent theme across several studies as did administrators' differing expectations for coaches. In certain mandated coaching programs, coaches reported that they were often perceived by teachers as supervisors or quasi-administrators. In other studies, administrators lacked a clear understanding of coaches' roles and may have reinforced the view that coaches served a teacher evaluation function. This was one explanation for the finding that coaches experience significant resistance from many teachers, particularly veteran teachers (Richard, 2003; Symonds, 2002). Other studies report that teacher resistance decreased over time, whether through positive word-of-mouth, increased role clarity, or first-hand experiences of coaches' effectiveness (Ertmer, et al., 2003; Knight, 2004b). Teacher resistance may follow on from other structural conditions, such as mandatory programs or administrative duties for coaches. Rivera,

Burley, and Sass (2004) note that inconsistent and unclear perceptions of roles and expectations not only led to confusion and conflict among the coaches, but also demonstrated adverse effects on the quality of the coaching practice.

Coaching content
Across studies, there was considerable variation in the coaching content itself and this appears to shape the conditions under which coaches work as influence the nature of coaching activities. Subject matter is one salient feature of "coaching content," and so are the degree of specificity, clarity, and available information associated with the "content." In some contexts, coaches work to support a particular curriculum (Feger, Woleck, & Hickman, 2005) while in others a more general approach, such as "balanced literacy." Some coaches are focused on a more over-arching pedagogical practice, such as questioning strategies. As noted in the introduction, some coaches work for external providers whereas others work to support a local initiative within their own school or district. For those who work for external providers, there are often considerable resources available for coaches to use in the form of manuals, articles, or lesson plans.

Across several studies, it appears that coaches themselves need time to develop requisite expertise in the "what" they are coaching. For example, Bach and Supovitz (2003) studied the progress of teachers and literacy coaches in implementing the writers' workshop component of America's Choice, a Comprehensive School Reform design. The study found that the literacy coaches performed somewhat better than the teachers they were instructing, but on average coaches were implementing workshops with no greater fidelity than were teachers. Further investigation confirmed a statistically significant link between the quality of coaches' implementation of the writers' workshop and teachers' ability to implement the workshop structures. In the available literature, there is not any predictable relationship between the specific coaching content and the nature of coaches' work; the literature suggests, however, that coaching work is not generic and is shaped by the features and structures of the content they are coaching.

Organizational Context
Particular structural issues impact coaches' work, and so does the overall organizational context beyond specific structures (Annenberg Institute for School Reform, n.d.). Rivera, Burley, and Sass (2004) found that the impacts of organizational context on instructional coaching were virtually inextricable from the effects of coaching on teachers at the school sites. Across a sample of twelve schools, they found schools with a general orientation toward collaboration were more likely to have coaches who were able to focus their efforts on classroom support, direct interaction, and the growth of their schools as sites for professional learning. Other accounts in the literature situate coaching as one of many school-based strategies intended to promote professional collaboration. In these environments, it appears that instructional coaching may take hold more quickly or more effectively.

Structural conditions – available time, voluntarism, role clarity, coaching content, and organizational context –are meaningful determinants of coaches' work. These structural

conditions influence the ways that coaches are able to undertake the coaching activities, such as lesson demonstration and debriefing discussed earlier in this review.

4. What kinds of knowledge, skills, and dispositions do coaches need to do their job?

The coaching literature lists a wide variety of knowledge, skills and dispositions associated with successful coaches, though research has not definitively established these elements. Broadly speaking, the literature asserts that effective coaches need skills in three key areas: content-specific instructional expertise; strong inter-personal skills; and sensitive communication skills (Killion & Harrison, 2005). The literature also suggests that across all three areas, coaches need to be expertly attuned to "diagnosing teachers' needs" and adjusting their responses to meet the particular instructional needs when working in the classroom (West & Staub, 2003, p.19).

The International Reading Association (2004; 2006), in collaboration with other professional organizations, has recently published standards for literacy coaches and position papers on the qualifications of reading coaches. These represent the stated ideal, if not the reality, of practicing instructional coaches. For high school and middle school literacy coaches, the International Reading Association states that coaches should be "skillful collaborators," "skillful job-embedded coaches," "skillful evaluators of literacy needs," and "skillful instructional strategists," (p. 5). The International Reading Association's standards further specify reading-related knowledge and competencies required for the coaching role, such as in-depth knowledge of reading processes, assessment, and instruction; expertise in working with teachers; presentation and group leadership skills; and the ability to model, observe, and provide feedback about instruction (IRA, 2004).

Dole (2004) provides a detailed list of the knowledge and competencies that reading specialists need in taking on the coaching role. On the instructional side, she asserts that reading coaches need "to know how to teach reading extremely well and to have actually done it successfully," (p. 469). She suggests that reading coaches need to be reflective practitioners who can diagnose and articulate what they see in a classroom.

West and Staub (2003) also emphasize the importance of content knowledge for instructional coaching in mathematics, including knowledge of how a discipline is developed through curricula and learning materials. They describe a coach's disposition and approach to communicating about content as important factors in establishing a working relationship with teachers particularly in content areas such as mathematics where teachers bring varying degrees of confidence to their instructional practice.

West and Staub assert that coaches must therefore be flexible in how they present and carry out the multiple roles associated with coaching in the classroom. For instance, a coach may work collegially to plan a lesson with a teacher, co-teach a lesson alongside a teacher, observe particular students, or create a transcript of a class discussion to review

with the teacher in a post-lesson meeting. They may also use more direct techniques, including presenting research-based practices, pointing out how to use curriculum materials, and conducting demonstration lessons. Finally, coaching requires communication skills in the conduct of coaching including identifying strategies and structures for classroom interactions, such as how to use pre- and post-conferences or on-the-spot coaching, and debriefing lessons (Neufeld & Roper, 2003).

While the literature focuses on the coaching as primarily working one-on-one with teachers to support them in the classroom, the role may also require skill in group facilitation and training, and knowledge of policy when working with district-level committees (Knight, 2004b). In carrying out their responsibilities in these varied contexts, coaches need additional professional knowledge and judgment. This can include trying to find the right balance in a role that requires establishing trusting relationships with teachers who are trying to change their practice is respected, while serving as a liaison between teachers and administrators to move forward with specific goals and to create a learning community in the school as a whole (Richard, 2003, p.19). Dole (2004) notes that in this area of interpersonal skills, that reading coaches also need to have "a sense of humor" as well as a sense of "when to support and nudge – balancing the fine line between supporting the status quo and placing too much stress on teachers," (p.469).

In addition to the content knowledge and interpersonal skills required for success in coaching, the literature notes that coaches also need pedagogical knowledge of how children learn, including a deep knowledge of the learning tasks, questioning strategies, and classroom structures that can help students develop ideas (Feger, Woleck, & Hickman, 2004). The curriculum itself is cited as a foundational element for coaching, and coaches need to become familiar with the structures and experiences offered by a particular curriculum, including understanding the fundamental ideas behind it and how those ideas connect across grade levels. Here an awareness of coaching resources, including specific knowledge of professional development materials, literature, and resources that can be used to support a teacher's development of content or pedagogical knowledge or help teachers better understand how to teach are also mentioned in the literature.

As with coaching activities, the list of coaching skills and knowledge is broad. Though it clusters along three dimensions – instructional expertise, interpersonal skills, and communicative ability – the research literature has yet to determine the relative importance of these elements. A small-scale study of digital literacy coaches (Ertmer et al 2003) found that participating coaches believed that strong inter-personal skills were more central to their effectiveness than strong content knowledge, partly because they felt that they could learn to improve their content expertise through training.

The frequent mention of inter-personal skills may arise from the fact that teachers are relatively new to the practice of collaboration. Lortie (1975) first described teachers' work as normatively private and isolated. Other analysts (such as Huberman, 1989) also note that teachers' career trajectories are typically flat; historically, there has been little opportunity for recognized expertise or differentiated staffing roles for teachers. Lastly,

teaching has been and continues to be a disproportionately female profession. For these reasons, the coaching literature's emphasis on relationship-building – including trust, support, acceptance, and affirmation – is perhaps less surprising. Though most of the published research studies agree that a variety of interpersonal skills are crucial, few are able to demonstrate their importance relative to a list of equally desirable competencies and dispositions. Across the literature, analysts nominate a wide variety of useful skills, but there is relatively little research that is definitive.

5. **What kinds of professional development and collaborative opportunities are available to coaches?**

Given the many skills and dispositions needed for successful coaching, it is not surprising that coaches themselves express a need for professional development. The literature identifies professional development as critical part of the coaching toolkit, especially for those who are newly moving into coaching role (Feger, Woleck, & Hickman, 2004; Richard, 2003). Professional development is important in this instance because it helps coaches establish a clear understanding of their role, and also serves as a model for the development of professional learning ethos to be extended to the school community.

However, given the newness of coaching, the literature describes this kind of professional development as often lacking. Neufeld and Roper (2003) cite a need for commitment on behalf of school districts to professional development for coaches as an important factor in developing a successful coaching program. They articulate several required elements in creating a professional development program for coaches. This includes knowledge of the "big picture" of the district's reforms, a strong orientation program introduced before the school year, differentiated learning opportunities for novice and experienced coaches, and making sure that coaches and teachers hear the same messages about the district's instructional reforms.

While little research is available on the effectiveness of professional development for coaches, Veenman and Denessen (2001) reported on an evaluation of a training program developed at the University of Nijmegen in the Netherlands. The training program was based upon the cognitive coaching model and its goals were to help teachers become more reflective and analytic about their practice. The program provided training to educators working with a variety of contexts, including secondary schools, where coaches were used to extend transfer of new knowledge of instructional strategies from in-service trainings to the classroom. Findings from the study showed that the training program positively affected the coaching skills of prospective coaches, with trained coaches rating higher than untrained coaches using a scale of coaching skills developed for the evaluation.

Collaboration around coaching practice is most often seen at the school level, but there are some emerging programs that provide a wider view. An example of coaches collaborating to support a statewide initiative is the Silicon Valley Mathematics Assessment Collaborative (MAC), a California network for professional development

supported by university faculty through district and foundation funds (Foster & Noyce, 2004). A focus of this network has been to develop formative assessments in mathematics that link to instructional coaching (p. 368). Coaches work together, and invite teachers to join them in weeklong institutes held during the summer where they develop and select two or three performance tasks for grades 3-7, during the school year. These discussions are described as leading to greater consistency in both pacing and coverage of mathematical content from teacher to teacher in the schools where the coaches work.

In discussions of coaches' professional development, differing pedagogies emerged. Some coaches participated in more traditional training sessions (Bach & Supovitz, 2003), whereas others met regularly with colleagues for less structured discussion and problem solving. Ertmer et al., (2003) found that the coaches in their study expressed a strong preference for more interactive and informal forms of professional development over transmission-oriented presentations by outside experts.

Professional development for coaches can address the many challenges identified throughout the literature. Challenges such as resistant teachers, scarce time, establishing trust, and uncertainty about the coaching role itself can all be addressed through professional development and support for the coaches. Though the literature on professional development for teachers is large and growing, there is much less that is specifically focused on professional development for instructional coaches. The studies discussed provide useful glimpses into individual programs, but do not allow for general conclusions or applications.

Conclusion: What is the current state of research on instructional coaching?

The research on instructional coaching is largely descriptive, involving case studies, observations, and interviews. Given the newness of instructional coaching, descriptive research is crucial. As Erickson and Gutierrez note, "A logically and empirically prior question to 'Did it work?' is 'What was the it?'—'What was the 'treatment' as actually delivered" (2002, p. 21). Looking across descriptive research studies, it is clear that at this point in time, the "treatment" varies by setting, if not by individual.

In addition to descriptive research, there is a small set of efficacy studies on coaching available. Los Angeles Unified School District (2002; 2004) and Supovitz et al….) are particularly useful examples for examining the impact of instructional coaching. Yet even these more rigorous studies have limited generalizability because coaching "models" vary across contexts. An instructional coaching intervention would need to be adopted with fidelity in order to replicate possible impact; this may be more common for school-change coaches working for a reform provider than instructional coaches assisting with implementing a curriculum or pedagogical approach. The relatively small number of studies may also be due to the methodological challenges and resource constraints of measuring changes in teacher practice (Desimone et al., 2002; Hill 2005; Porter, 2002; Rowan et al. 2002; Rowan et al, 2004). Linking coaching to improved student outcomes

is similarly complex. Few studies of the effects of instructional coaching have been designed to measure both.

Prior to conducting this literature review, the evaluators and the Design Team framed several useful questions about instructional coaching that this not turn out to be featured in the available studies and accounts. For example, the Design Team asked, "How are instructional coaches evaluated by their employers? What empirical evidence, if any, is available about the effectiveness of instructional coaches? Is instructional coaching increasing or decreasing as a support for teachers?" The evaluation team did not find any studies that offered more than tangential information about these important questions.

The evaluation team also spent time trying to find research to address the Design Team's question about coaches' use of technology, nor their attitudes about or skills with technology. The literature review did identify a few "technology coach" positions where the coaches provided tailored support for technology skill development, but there was little research uncovered that spoke to coaches' use of technology as part of their coaching repertoires. Lastly, a scan of job descriptions for instructional coaching positions in various school districts did not reference any required technology use or competencies for applicants in using technology (Christina School District, 2005; Greenville County Schools, 2005; Knox County Schools, 2005; Jefferson County Public Schools, 2004).

There are other gaps in the literature. For one, no cost-benefit studies emerged from the literature search. Instructional coaching can be a resource intensive reform yet little is known about its actual rather than presumed effects. Both district leaders as well as researchers would be eager to know whether instructional coaching merits its costs or how its costs and benefits compare to other professional development strategies.

Finally, there are many pressing questions about instructional coaching that are generated from those findings currently available. The literature shows, for example, that coaches engage in a range of activities, from lesson demonstration, to observation, to curriculum consultation. Which of these do teachers find most valuable? How should coaches spend their time? Similarly, the literature shows that coaches need content expertise, interpersonal skills, and communication skills. What, then, are optimal ways to identify, hire, and support instructional coaches as they do their work? Across studies synthesized for this review, there is a growing body of information about the instructional coaching role, but as yet, little definitive evidence about its impact. At this point in time, researchers need to specify explicit coaching frameworks as they analyze the components of coaching and their possible impacts. For local educators, increased clarity and a more precise framework can allow more strategic and informed decision-making about when and how to use coaches.

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