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This brief is one of five perspective briefs developed as part of the Promoting Student Success in Algebra I (PSSA) project that summarize the perspectives of district administrators and mathematics teachers about research on five strategies to help struggling students in Grades 6–9 succeed in algebra. For additional information regarding the project and the products developed, please visit: http://www2.ed.gov/programs/dropout/resources.html.

Instructional Coaching to Support Struggling Algebra I Students

Perspective Brief

This perspective brief offers an in-depth look at how district math leaders and Algebra I teachers think about research examining instructional coaching as a strategy to support student success in Algebra I.

The Promoting Student Success in Algebra I (PSSA) project, funded by the U.S. Department of Education, recently reviewed existing research on this strategy,[1] but the findings from this study may not capture practitioners' perspectives, shaped by their experience in the field. This brief examines whether the research findings resonate with practitioners' experience, and if not, why not. It also examines practitioners' perspectives on what program developers and administrators need to consider when supporting the development and implementation of this strategy—the key challenges and barriers to success. Practitioners are uniquely positioned to identify key considerations given their knowledge and experience with this strategy to support struggling students.

Instructional coaching initiatives vary in focus and format but share the common goal of promoting student success in algebra and other subjects by helping teachers improve their knowledge, skill, and practice in ways that advance student learning. Often provided in conjunction with other professional learning supports, coaching activities such as joint lesson planning, classroom observations, coteaching, and debriefing offer opportunities for teachers to collaborate with a technical expert regarding their day-to-day work planning, delivering, and reflecting upon instruction (Croft, Coggshall, Dolan, & Powers, 2010; West & Saphier, 2009).

[1] See http://www2.ed.gov/programs/dropout/resources.html

Helping algebra teachers improve their teaching practices is as important and challenging as ever with the implementation of more rigorous college- and career-readiness standards in mathematics and the adoption by states of the Common Core State Standards for Mathematics (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010), which incorporates mathematics standards from high-performing countries and raises the bar for what and how students learn (Kober & Rentner, 2012). As students are being held to higher standards of learning, teachers are being held to higher standards of teaching, heightening the need for algebra instructional coaching programs that are informed by the latest research.

To better understand practitioners' perspectives on research on instructional coaching, we asked a focus group of four district math leaders (math coordinators, coaches, and instructional leaders) and a focus group of five Algebra I teachers to read the PSSA project's research brief outlining evidence to date—*Instructional Coaching Strategies to Support Student Success in Algebra I: Research Brief* [2]—and discuss whether and how key research findings resonated with their experience. Key findings from the research brief are summarized briefly in Exhibit 1.

Exhibit 1. Key Findings From the Review of Research on Instructional Coaching

A review of rigorous research on instructional coaching activities to promote student success in Algebra I suggested the following:

- Coaching programs with rigorous evidence of impact have tended to:
  - Focus on providing teachers with structured feedback on a narrow set of instructional practices.
  - Emphasize strategies to improve student engagement and student reasoning.
  - Use expert, well-trained coaches.
  - Take more than one year to show gains in student achievement outcomes.
- Coaching programs might have a stronger influence on teachers who participate voluntarily.
- Web-based technologies and video can serve as useful tools for providing teachers with explicit feedback on specific aspects of their teaching.

Each group included one representative from a rural district and three or four representatives from some of the 100 largest districts across the country to ensure that the practitioners' perspectives reflected at least some of the challenges facing both urban

[2] See https://www2.ed.gov/programs/dropout/instructionalcoaching092414.pdf

and rural educators.[3] Both district math leaders and Algebra I teachers were asked to make connections between research and practice by addressing three broad questions:

- *How do the research findings resonate with your experiences in the field?*
- *What challenges do you foresee in implementing recommendations from the research, and what supports are needed?*
- *Are there any important factors to consider that are not addressed in the existing research?*

Analyses of the focus group data indicated that participants generally agreed with the research findings, but they provided additional considerations for particular findings from their experiences in the field.

In short, district mathematics leaders and Algebra I teachers suggested that:

- Coaching programs should target a narrow, specified set of instructional strategies that are designed to enhance student engagement and promote students' mathematical reasoning.
- Coaching programs should be integrated into broader systems of teacher professional learning support that include both intermediate and longer-term outcomes, including improvements in student achievement.
- Highly skilled coaches have deep expertise in mathematical content and pedagogy, understand how the coaching program is aligned with district- and school-level instructional initiatives, and are able to create productive, non-evaluative learning environments for teachers.

These perspectives of practitioners are elaborated in the following sections, and implications of these perspectives for program development and implementation are highlighted at the end of this brief. Because the perspectives highlighted in this brief represent only nine practitioners, we encourage readers to use caution when drawing conclusions. Nonetheless, these practitioners' voices give depth and richness to the findings in the research brief.

[3] See the appendix of this brief for additional information about the methods used to collect and analyze practitioners' perspectives.

Participants' Perspectives on the Research

The following sections highlight the perspectives of district mathematics leaders and Algebra I teachers that emerged from focus group discussions. Because participants were asked specifically about their perspectives on key findings from the research brief, their responses are organized around these topics. For each section, we begin with a brief recap of relevant research findings followed by an exploration of key themes from the focus group participants' reactions to the research.

PROVIDING STRUCTURED FEEDBACK ON A NARROW SET OF INSTRUCTIONAL PRACTICES

Multiple research studies have reported that the most productive coaching activities use specific structures to frame feedback for teachers, such as coteaching, observation, and joint planning and reflection (Bradley, 2007; Jackson & Cobb, 2013; Neufeld & Roper, 2003; Olson & Barrett, 2004). District and teacher focus group participants concurred that these structures were important, arguing that engaging teachers in feedback sessions on their lesson design and execution constitutes a key leverage point for coaches to improve teacher knowledge and practice. Several district focus group participants described how their district's most influential coaches push and challenge teachers to reflect on how they can better serve their students. Teacher participants similarly touted the benefits of receiving constructive feedback on their instruction and specifically highlighted the advantages in receiving coach input during their lesson-planning work, which they described as a useful but sometimes overlooked opportunity for coaches to inform teacher practice. For example, if a coaching initiative is intended to support teachers in implementing particular approaches to instruction, then collaborating with a coach during the lesson design phase could help teachers embed those approaches into their lesson from the outset. Moreover, coaches' involvement in teacher lesson-planning activities can provide coaches with useful insights to guide their subsequent observation of and feedback on the lesson's delivery.

Engaging teachers in feedback sessions on their lesson design and execution is a key leverage point for improving knowledge and practice.

"I think the only way to go and give feedback is to have a rubric … [to] see these are the areas I'm weak in … but the areas I'm doing all right in, too."
—Algebra teacher

Within these structures, teacher participants agreed with the research findings that coaching rubrics can serve as useful tools for framing feedback. One teacher noted that having a comprehensive rubric is important for identifying actionable strengths and areas for improvement:

> I think the only way to go and give feedback is to have a rubric with all kinds of different components: lesson planning, questioning techniques, strategies, best practices. [This] all needs to be incorporated into a rubric so you can not only see these are the areas I'm weak in but…the areas I'm doing all right in, too.

"We tried to look at the National Math Panel recommendations. We looked at what Marzano said, the nine instructional focuses… We looked at the Common Core Standards. We made a list of all those things, and we said, 'Okay, so if our teachers will just do th[ese] 120 things.'"
—District mathematics leader

An advantage of a comprehensive rubric is that it offers several areas where a coach and teacher might target their work. Yet, focus group participants made clear that having a comprehensive rubric does not mean that coaches should cover a wide range of topics. Instead, they echoed the research findings that coaches should concentrate their feedback on a narrow set of strategies. A district-level participant recounted how leaders in his district began a coaching initiative with a laundry list of topics for coaches to cover with teachers but quickly discovered they were taking on too much. Although they referred to widely cited publications for guidance, such as the National Math Panel report, they ended up with a list of recommendations that was unwieldy. Ultimately, they honed the focus of coaches' work to concentrate on a pair of issues that encompassed multiple teaching skills: the quality of teachers' instructional tasks and the questions that teachers use to prompt student thinking.

While acknowledging the importance of narrow, focused feedback, teacher participants pointed out that this is not always the kind of feedback they receive. In some cases, the coach's attention was divided across too many schools or teachers to provide this type of feedback. Several teacher participants recalled their disappointment when coaches assigned to work with them for a specified number of sessions spent that time engaged in perfunctory activities such as disseminating materials or conducting a brief classroom "drop-in" rather than engaging them in a meaningful dialogue about the content and delivery of their instruction. One teacher, who was promised a full 35 hours of instructional coaching, said of her coach, "Basically, if he pops in and says 'Hi,' [and] gives me a thumbs-up...that would be considered an hour of his coaching time with me." Another teacher, whose coach was shared across many schools within her district,

related a similar experience and felt that her coach's limited attention to her and her classroom depleted the value of the coach's feedback. "When you have someone who's just checking in with you so infrequently and is not completely integrated in the school, in the culture, in your classroom, with the students and with you, then it's going to be completely ineffective," she said. Accordingly, teacher focus group participants indicated that intensity of coaching support should be understood not only in terms of contact hours but also in terms of the nature and quality of the coach's activities with teachers, including his or her thoughtful provision of detailed feedback.

In the next section, we highlight practitioners' perspective on coaching that emphasizes strategies to get at student thinking and the research supporting this initiative.

EMPHASIS ON STRATEGIES TO IMPROVE STUDENT ENGAGEMENT AND REASONING

Rigorous experimental studies highlighted in the research brief have provided compelling evidence that coaching programs can be used to enhance students' engagement and mathematical reasoning skills. For instance, an experimental study of one coaching and professional development program that emphasized making student thinking (e.g., approaches, conceptions, and misconceptions) the focal point of teaching found that students of participating teachers outperformed their peers on written and oral assessments of mathematical thinking (Jacobs, Franke, Carpenter, Levi, & Battey, 2007). District and teacher focus group participants echoed such recommendations that coaching should emphasize strategies related to student engagement and reasoning (for examples of such strategies suggested to program developers and administrators in the research brief, see the textbox "Strategies for Enhancing Student Engagement and Reasoning"). As one district administrator observed, "[Coaching] has to target student engagement because if your students aren't actively engaged in the lesson, no one's learning anything." This administrator specified that students' engagement should occur through mathematics content; therefore, coaches' work should focus on supporting teachers in ensuring that students are "mathematically engaged in a rich, learning

Strategies for Enhancing Student Engagement and Reasoning

Examples of strategies that coaches might use with teachers to promote student engagement and reasoning:

- *Classroom discourse practices*
- *Opportunities to highlight student conceptions and misconceptions*
- *Interesting tasks, such as formative assessment lessons*
- *Problem-solving activities*

experience." Like district-level participants, teachers expressed a strong preference for coaches to focus on issues that influence student thinking and engagement, indicating that they would discount feedback that did not clearly relate to students' ability to comprehend and engage with mathematics content. Several teachers also underscored how coaches can play particularly useful roles in helping teachers recognize and anticipate problems with students' reasoning and understanding. As one teacher explained:

> People never talk about…student misconceptions. Rarely do people listen to the kids or ask them questions about what do you see; how do you interpret that? But, if you had time to do that, you might have figured out [what] the misconception is going to be.

Teacher focus group participants further argued that the specific focus of coaches' work might need to be differentiated to account for teachers' various strengths and needs, noting that teachers with different educational backgrounds and professional experiences might require coaching support on different topics—for example, a teacher with strong content knowledge might need support with classroom management or particular pedagogical strategies. For district-administered coaching initiatives, district participants pointed out that negotiating between district-level and individual school-level visions for instructional improvement also warrants thoughtful consideration when distinguishing the focus of coaches' work, particularly in large districts where schools have various teacher learning needs and follow disparate approaches to instruction.

Promoting active student engagement may involve negotiating district- and school-level visions of instructional improvement.

One district noted the following:

> We have some things that we want in the math classes, but ultimately the pressures of what the school focus is wins out. You can find ways to make those merge but... [in] larger districts, [it's] marrying the district need versus the school need and the teacher need and comfortability.

Effective coaching programs hone in on strategies to increase student engagement and make student thinking visible. In order to achieve this, coaches must be keenly aware and account for teachers' knowledge and ability, as well as their vision as it compares to the district and school vision. However, as detailed next, these efforts may be less effective if initiatives are mandatory rather than voluntary.

TEACHERS' VOLUNTARY PARTICIPATION

Research findings suggest that instructional coaching programs may have a stronger influence on teacher and student outcomes when teachers participate in coaching activities voluntarily (Battey & Franke, 2008; Edmondson, 2006; Supovitz, 2012). This idea resonated particularly strongly with district focus group participants: Several recalled experiences in their districts when mandated instructional coaching generated low teacher buy-in, potentially diminishing the coaches' ability to influence teacher practice. One district participant attributed the slow rollout of her district's instructional coaching initiative to teachers' pushback against its mandatory nature; however, she acknowledged that the initially resistant teachers eventually came to appreciate the support they received from their coaches. Accordingly, her experience suggests that mandated participation does not necessarily preclude coaching from having a positive influence.

Coaching should be framed as a way to improve practice, not evaluate performance.

Establishing trusting and nonjudgmental coaching relationships emerged from the focus group discussions as additional conditions that facilitate successful instructional coaching. District participants recommended that coaching be grounded as a teacher support, provided to meet the coach's and the teacher's shared goal of improving student success. They advocated clearly demarcating the role of instructional coaches from that of teacher evaluators, arguing that coaching should be about improving teacher practice, not evaluating teacher performance. District officials cautioned that this distinction could become lost among teachers and administrators.

One participant gave this warning:

> If you're a teacher and you're told you're going to have a coach, [then] that says a lot if it's not framed the right way in an era of high-stakes evaluation, no matter what the definition of a coach is on paper.

"Transparency is key in a coaching relationship, [but] oftentimes, it's missing…when you want to make changes and people are not help[ing] you make changes, that can sometimes be discouraging."
—Algebra teacher

District and teacher participants further argued that the trust between a teacher and his or her coach must run both ways: Not only do teachers need to feel comfortable exposing their practice to a coach, but coaches must feel at ease providing open, honest, and transparent feedback.

In short, focus group participants felt that in addition to being voluntary, instructional coaching should be explicitly defined as nonevaluative and based on a relationship of mutual trust. District leaders and mathematics teachers expanded upon this by articulating specific characteristics and qualifications they expect to see in a successful instructional coach.

USE OF WELL-TRAINED, EXPERT COACHES

Research findings on successful instructional coaching initiatives underscore the use of expert, well-trained coaches (Campbell & Malkus, 2011). For example, one study found that teachers sought a coach's advice on the basis of several criteria, including the coach's level of experience and familiarity with the curriculum, the teacher's history of working with the coach, and the teacher's perception of the coach's ability (Gibbons, Garrison, & Cobb, n.d.). The significance of using expert, well-trained coaches resonated with district leaders and mathematics teachers' experience with instructional coaching. Focus group participants agreed that meaningful teacher–coach interactions hinged upon the coach's knowledge, skills, and credibility. Both district and teacher focus group participants stressed the importance of employing coaches with deep substantive expertise in mathematics content and pedagogy as well as a track record of success in providing high-quality mathematics instruction. In particular, they emphasized that coaches should have rich mathematical content knowledge coupled with a keen understanding of how students engage with mathematics, including the ability to anticipate student misconceptions, recognize instances of unintended learning, foster students' sustained exploration of mathematics content, and promote appropriate use of mathematical language. Coaches also should be adept at devising and modeling numerous ways of presenting mathematics content to promote students' conceptual understanding.

Expert coaches not only know the content, but they also understand how that content plays out in real classrooms with real students within particular district and school instructional contexts.

Although focus group participants emphasized the need for coaches to possess strong experience and expertise in teaching Algebra I, they cautioned that prior success as an Algebra I teacher does not guarantee success as an Algebra I coach because the dynamics of working with adult learners differs from the dynamics of working with students. District participants related several incidents where coaches ended up alienating teachers by approaching them with an "I'm-going-to-fix-you attitude" or treating teachers as if they were young students. Focus group participants argued that to facilitate productive interactions with teachers, coaches must appreciate what it means to be an adult learner and understand how to engage with adults in ways that support their professional growth. One teacher felt it was essential for coaches to have experienced coaching as a teacher themselves. Focus group participants indicated that the "savvy" required for working with adult learners likely includes some intangible elements, but they identified passion, flexibility, discretion, professionalism, respect for the teaching craft, and credibility as key qualities that might contribute to coaches' effectiveness with teachers. Participants also mentioned humility and self-reflection as important traits for coaches. According to one district administrator, coaches' willingness to honestly reflect on the quality of their coaching support could not only improve their coaching and build teacher trust but also model the types of reflective behaviors they should encourage from teachers.

Focus group participants identified the following as important qualities of successful instructional coaches:

- *Deep substantive expertise in math content and pedagogy*
- *Ability to understand and work with adult learners*
- *A thorough understanding of the local instructional context*

In addition to possessing strong generalized knowledge about mathematics content and pedagogy and adult learning theories, focus group participants advised that coaches should be deeply familiar with key aspects of the specific instructional context in which teachers are working. For instance, they argued that coaches should have a firm grasp of—and ideally enthusiasm for—the mathematics content standards and curricular frameworks that teachers are expected to use. Both district and teacher focus group participants emphasized that coaches should have a clear understanding of how mathematics concepts are vertically articulated across grade levels to help teachers recognize and make connections with students' learning in previous coursework as well as anticipate and prepare students for the content they will encounter in more advanced coursework. One teacher participant explained:

> Since it's not realistic that I know perfectly what every kindergarten, first-, second-, third-, fourth-grade, fifth-, sixth-grade teacher does every day, [it is helpful that] there's somebody there to remind me, "They're doing this, and they're doing it well, and it connects to you in this way," and then let me run with that.

To further promote instructional coherence, district participants stressed that coaches should be attuned to the specific instructional approaches employed in the district and take steps to ensure they share a common vocabulary with teachers for discussing those approaches. As one district participant commented:

> There should also be a common language in terms of some of the major instructional strategies and pedagogical underpinnings that really are going to be embedded in the classroom and how that might be able to surface itself in conversations that happen with teachers. Not just from coach [to] teacher, but among coaches across the district.

It is important to have common, straightforward language to describe district instructional initiatives and strategies.

Research has suggested that employing expert, well-trained coaches strengthens the implementation of instructional coaching, yet the research does not specify the strategies for recruiting and training such coaches. As they discussed the research on successful implementation of instructional coaching, district leaders and mathematics teachers noted potential challenges to recruiting and retaining strong instructional coaches and shared ideas for overcoming these barriers.

RECRUITMENT AND RETENTION OF COACHES

In describing the qualities they associated with strong instructional coaches, focus group participants acknowledged obstacles in recruiting and training coaches to possess these qualities. They noted factors such as star teachers' unwillingness to take on coaching roles (e.g., because they are devoted to classroom teaching or they associate coaching with reduced job security because of its vulnerability to funding cuts), administrators' desire to keep high-performing teachers in the classroom, and politically motivated coach hiring practices (e.g., placing an ineffective teacher in a coaching position to remove him or her from the classroom) as barriers to recruiting coaches with desired expertise. They mentioned also that limited access to mathematics coach training or credentialing programs can present further challenges, particularly for rural communities where teachers must travel far distances to participate in such programs. To combat some of these barriers, teacher focus group participants suggested instituting a rotation

Teacher focus group participants suggested instituting a rotation model in which strong mathematics coaches would return to classroom teaching every few years, allowing them to continue their teaching role and helping them remain current in their own instructional practices.

model in which strong mathematics coaches would return to classroom teaching every few years, allowing them to continue their teaching role and helping them remain current in their own instructional practices. District participants underscored the importance of using careful screening procedures during the coach hiring process, citing advanced qualifications such as National Board Certification or documented evidence of improving student outcomes as helpful indicators to examine when considering candidates for coaching positions. The hope is that with these structures in place, schools and districts would have access to qualified coaches.

USE OF WEB- AND VIDEO-BASED DELIVERY SYSTEMS

The research brief highlighted a number of recent research studies that point to the utility of using Web-based technologies and video—either in real or delayed time—as mediums for coaches to provide teachers with explicit feedback about specific aspects of their teaching (Allen, Pianta, Gregory, Mikami, & Lun, 2011; Edmonson, 2006; Supovitz, 2012). Focus group participants expressed mixed feelings about the use of such systems. Several district and teacher participants hailed these technologies as promising tools for supplying teachers with substantive, content-focused feedback. For instance, teacher participants described these systems as a potentially economical means of expanding teachers' access to coaches with strong mathematics expertise, particularly when similarly qualified coaches are not available within or near their school site. Teacher participants also underscored the benefit of reviewing video clips of their observed instruction with their coach during lesson debriefing sessions to ground their discussions with concrete examples. A couple of teacher participants further noted that schools can use Web- or video-based coaching programs to generate an archive of videotaped lessons that teachers in the school can access in the future to reflect on sample lesson content and execution.

Participants see the benefits ofcoaching models delivered in-person and through video—a hybrid approach is perhaps best.

Although many focus group participants saw promise in using Web- and video-based coaching systems, several advised against embracing these new technologies without thoughtfully considering their limitations. Teacher participants, for example, mentioned concerns about the timeliness of feedback they would receive from remotely located coaches, although one participant emphasized a willingness to forgo some level of immediacy in exchange for stronger feedback from a more knowledgeable coach, provided the feedback arrived while she still had some recollection of the observed lesson and its outcomes. District

participants raised doubts as to whether exclusively Web- or video-based interactions between teachers and coaches could yield the same level of trust and shared responsibility as in-person interactions. As a district participant explained:

> When you do face-to-face [coaching], there's a different level of accountability. There's relationship forming. There's a different layer of trust. There's a different layer of long-term expectation…that action happens from this, and expectation that the coach and the teacher will be there for one another.

To support the development of such relationships, district participants suggested employing a hybrid model that blends technology-based interactions with one-on-one interactions, particularly early in the coaching process.

District and teacher participants further voiced concerns that the logistics of setting up and operating technology-based coaching systems—everything from acquiring necessary equipment with the right technical specifications to ensuring that equipment functions properly during teacher observations to collecting parental consent for videotaping students—might end up detracting from the coaching experience if not properly addressed. A district participant indicated that having a clear checklist that outlines important logistical considerations could serve as a valuable tool in facilitating the implementation of Web- or video-based coaching systems but noted that districts often lack such tools.

TIMELINE AND SUPPORTS FOR COACHING TO IMPACT STUDENT OUTCOMES

As discussed in the research brief, several of the most rigorous studies examining instructional coaching's impact on student achievement found no significant differences in student outcomes after the first year of coaching implementation but did find significant differences in subsequent years in favor of students whose teachers received coaching (Allen et al., 2011; Campbell & Malkus, 2011). Focus group participants expressed surprise at these research findings, and some hypothesized that the multiyear timeline for observing student achievement gains might reflect the time needed for coaches and teachers to build deep, trusting relationships that facilitate meaningful teacher reflection and changes in practice. Focus group participants discussed two implications that the multiyear timeline for generating student achievement gains had regarding the adoption and sustainability of instructional coaching as a strategy for promoting student success.

The benefits ofcoaching might not immediately translate to improved student outcomes—coaching initiatives should be viewed more like a marathon than a sprint.

First, focus group participants underscored how stakeholders must understand and commit to instructional coaching as a long-term process for improving student outcomes. For example, district

focus group participants emphasized the need for developing a thoughtful approach to securing long-term political and financial support. Across stakeholders at all levels of the system, leaders of instructional coaching initiatives should, at the onset, establish clear expectations that this strategy will entail a long-term change process and ensure that stakeholders are willing to see the process through. Teacher focus group participants reinforced the district participants' emphasis on garnering sustained political and financial support, indicating that funding cuts to teacher coaching programs can send the message that the strategy is not viewed as a priority.

District focus group participants admitted that an inability to demonstrate immediate student achievement gains could present challenges for sustaining coaching initiatives because those outcomes tend to carry the most weight politically and are important for acquiring and maintaining grant support. However, participants advocated using intermediate outcome measures, such as changes in teacher attitudes or practices as well as student performance on formative assessments, to evaluate coaching initiatives' early progress and make necessary adjustments midcourse. One district administrator concluded:

> It's understanding that we're in a marathon, and we're not in a hundred meter dash, and what are the intermediate milestones that we can define that get us there while at the same time…respecting the fact that we're going to have to adjust and change course as we start to learn a little bit more about the research that starts to bubble up from the field.

District and teacher participants also suggested that incorporating coaching into a multilayered system for supporting instructional improvement rather than providing coaching in isolation could promote the sustainability of coaches' work and extend its influence to a greater number of teachers. Focus group participants suggested that connecting coaching to teacher collaboration opportunities can be particularly effective in broadening the coaching's value. For instance, one teacher participant described a grant-funded coaching initiative in which a small number of coaches were assigned to work one-on-one with a group of approximately 100 mathematics teachers. The teacher explained that the coaches were able to disseminate strategies and feedback to more than double the number of teachers initially targeted through the grant by attending the teachers' collaborative meetings with teachers outside of the coaching program. Similarly, a district focus group participant mentioned how simply providing teacher collaboration opportunities in conjunction with coaching supports—regardless

"It's important to have that system, that … suite of supports. Otherwise, if you're missing a different piece here and there, the effect of coaching starts to get marginalized each time you remove a layer from it."
—District mathematics leader

of whether coaches attend teacher collaboration meetings—can provide a useful space for teachers to discuss what they have learned individually from their coaches, potentially deepening their own understanding of coaches' input while sharing it with others.

Although surprised by the multiyear timeline for generating student achievement gains, district leaders and mathematics teachers still see instructional coaching as a viable initiative to support struggling students in Algebra I. This knowledge puts them in a unique position to be proactive in gaining long-term support for instructional coaching from stakeholders and coupling coaching with other initiatives to extend its influence.

SUMMARY OF PERSPECTIVES ON INSTRUCTIONAL COACHING

In summary, focus group participants agreed with the research suggesting that strong coaching programs narrow the lens through which coaches provide feedback and that there should be an intentional emphasis on improving student engagement and student reasoning. The research findings that pointed to voluntary participation and well-trained, expert coaches as key to successful implementation resonated with the district leaders and mathematics teachers. However, given their experience with instructional coaching, they expanded on the research to define the qualities of a well-trained, expert coach and shed light on the challenges and strategies for recruiting and retaining these coaches. Focus group participants were cautiously optimistic of Web-and video-based coaching systems, noting both the benefits and limitations that must be considered before implementation. Last, respondents were surprised by the multiyear timeline for observing student achievement gains but thought strategically on how to combat this and garner support for adoption and sustainability of instructional coaching.

Implications for Program Developers and Administrators

The district administrators and mathematics teachers who shared their perspectives on instructional coaching research for this brief revealed several potential insights for program developers and administrators who are working to improve the quality of algebra teaching and learning through instructional coaching initiatives. Although participants' often concurred with the research findings, they did expand on that research with insights from their own experiences. As program developers and administrators consider implementing instructional coaching, they should consider how the reactions of the participants in this particular project may or may not relate to their own educational context. Exhibit 2 summarizes those insights along with potential implications for local practice.

Exhibit 2. Key Findings From Focus Group Participants' Perspectives on the Research and Implications for Practice

Key Focus Group Findings	Considerations for Program Developers and Administrators
Provide teachers with focused feedback that targets issues related to student reasoning and engagement.	• Ensure that coaching sessions are of sufficient length and frequency for coaches to provide detailed feedback on teachers' instruction and engage teachers in thoughtful reflections about their practice. • Develop rubrics that focus coaches' attention on a coherent set of high-leverage strategies that target student reasoning and engagement. • Ensure that coaches have manageable teacher caseloads that enable them time to provide thoughtful, substantive reflections on teachers' practice based on a keen sense of their individual strengths and needs.
Employ highly skilled coaches who possess deep expertise in mathematical content and pedagogy paired with adeptness in working with adult learners.	• Implement rigorous coach hiring practices that assess competencies related to mathematics content and pedagogy as well as adult learning. • Examine the current pool of applicants for coaching positions, turnover rates, and recruitment and retention incentives with an eye toward strategically redesigning the human resource systems that are used to select existing coaches. • Provide upfront training and ongoing professional learning support for coaches. • Partner with local institutions of higher education to develop rigorous mathematics coach credentialing programs.
Provide feedback that aligns with the local instructional context.	• Provide training and including coaches in other teacher professional learning supports to promote their understanding of district and school curricula, instructional approaches, and terminology. • Hire from within the local school system to the degree possible.

Key Focus Group Findings	Considerations for Program Developers and Administrators
May leverage Web- and video-based coaching delivery systems to reach more teachers.	• Provide training for teachers and coaches on how to use the technology effectively. • Anticipate technical challenges and provide logistical support.
Ensure a comfortable, nonevaluative environment for teachers.	• Secure buy-in from administrators and teachers. • Institute coaching at least initially voluntarily. • Distinguish coaching activities from teaching evaluation activities and ensure that teachers and administrators understand the difference.
Integrate instructional coaching into a coherent, long-term system of teacher professional learning support.	• Create hybrid professional development systems where coaching is combined with other forms of professional development, such as institutes to convey content or professional learning communities to support ongoing collaboration and peer support. • Treat coaching as a long-term investment and establish and evaluate progress in intermediate outcomes that are relevant to student success.

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Appendix

To examine how district policymakers and teachers use and make sense of research on instructional coaching, the project team convened a group of experienced district mathematics leaders (including mathematics coordinators, district mathematics coaches, and other district-level instructional leaders) and teachers of Algebra I to participate in focus group discussions about key findings from the research.

Using a multistep process, we purposively selected focus group participants to include district administrators and teachers on the basis of their degree of knowledge and experience with the strategies of interest as well as to ensure representation of diverse types of educational contexts (e.g., rural and urban settings, middle and high schools). We identified school districts among the 100 largest local education agencies and from a list of all U.S. rural districts with which project team members had previously worked or that had been referred to us by external experts as strong candidates for discussions focused on helping struggling students succeed in Algebra I. Making sure we nominated no more than two districts from the same state, we identified 14 initial districts—10 urban and four rural—which we contacted by e-mail with information about the project and a request for an informational interview. Each nominated district was asked to nominate a teacher representative and to share biographical information for both district and teacher representatives. Nominated representatives subsequently participated in a brief interview designed to assess their experience and familiarity with five focal strategies for the Promoting Student Success in Algebra project, as well as their interest and availability in participating in the focus groups, to be conducted as part of a two-day meeting held at the offices of American Institutes for Research (AIR) in Washington, D.C. The U.S. Department of Education's Office of Elementary and Secondary Education and AIR ultimately selected seven of the 14 districts (five urban and two rural) from seven states located in different regions of the United States to participate in the focus groups, including one district and one teacher representative for each district (14 individuals total). District and teacher representatives collectively averaged 15 years of experience teaching mathematics, and teacher representatives averaged nine years of experience teaching Algebra I specifically.

Participants were asked to read the research briefs in advance and received a series of open-ended questions to guide their reading. For each of the five topic areas of focus in this study, two 90-minute focus groups with either four or five participants were conducted, one with district leaders and one with teachers. This configuration provided space for participants to focus on the issues most salient to the role they play in the district and be forthright in their responses as they were surrounded by their district- or classroom-level peers. The project team ensured that each focus group included at least

one participant from a rural district. The facilitators of the focus groups were careful to ensure that they monitored the time during the focus groups so that they covered all topics during the discussion.

The focus group protocol featured open-ended questions designed to elicit deep conversation about specific research findings from the research briefs. To facilitate conversation, each question was followed by focused probes to ascertain insights into important areas. For example, probes explored questions regarding “how,” “under what conditions,” and “why” to gain a full understanding of participants’ perspectives on each strategy as well as contextual factors that affect those perspectives.

To facilitate data collection, all focus group sessions were audio-recorded and featured a note-taker, who captured information that provided context for the audio-recording (e.g., keeping a record of which remarks came from which participant in case it was difficult to distinguish speakers on the audio-recording). After the meeting, transcriptions of each focus group were created and content coded. The study team analyzed and coded data with an initial set of codes based on themes that emerged in the research briefs, and in iterative fashion, codes were combined and/or revised as patterns emerged. Transcripts were double coded and assessed for interrater agreement, and disagreements were resolved to agreement. Findings from these analyses form the structure of this perspective brief; the goal is to document key insights from administrators and teachers on the extent to which the research resonates with their own experience and the important factors that are not addressed in the existing literature.

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