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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 math 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>

## Supplementary Supports for 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 on two supplementary support strategies designed to support struggling students—double-dose algebra and expanded learning opportunities (ELOs).

### *What is double-dose algebra?*

Double-dose algebra, often termed “stretch algebra” or “double-period algebra,” provides struggling students a second class period during the school day to focus on algebraic content or related material beyond their standard Algebra I course.

### *What are expanded learning opportunities?*

Expanded learning opportunities, also called out-of-school-time programs, are diverse in structure, including a range of student programs and activities that occur beyond the traditional school hours—before and after school, and during weekends, evenings, and summers—to support and enrich student learning.

The Promoting Student Success in Algebra I (PSSA) project, funded by the U.S. Department of Education, recently reviewed existing research on these strategies,<sup>1</sup> but the findings from these studies 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 may need to consider when supporting the development and implementation of these strategies—the key challenges and barriers to success. Practitioners are uniquely positioned to identify key considerations given their knowledge and experience with these strategies to support struggling students.

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<sup>1</sup> See <http://www2.ed.gov/programs/dropout/resources.html>

Districts across the country increasingly require Algebra I for graduation, and many now require all first-time ninth grade students to enroll in the course. Yet, some students will be underprepared, lacking some of the mathematical proficiencies critical for success in the course—e.g., mastery of fractions, integers, number sense—and will struggle with the course content. Others may struggle with broader social-behavioral and academic challenges associated with making the transition to high school. Although the underlying problem and solution may differ for students, it is clear that failing Algebra I can have dire consequences, including dropout (e.g., Oriheula, 2006; Silver, Saunders, & Zarate, 2008). For example, Silver and colleagues (2008) found that in Los Angeles, California, 70 percent of students who pass Algebra I by the end of ninth grade ultimately graduate high school on time in contrast to only 35 percent of students who do not pass Algebra I. Providing struggling students the resources they need to succeed in Algebra I is critically important. Although educators use many different approaches to support struggling students, this brief focuses on double-dose algebra and ELOs, given their widespread use in the field as strategies to prevent academic failure.

To better understand practitioners' perspectives on research on double-dose algebra and ELOs, 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—Supplementary Learning Strategies to Support Student Success in Algebra I: Research Brief<sup>2</sup>—and discuss whether and how key research findings resonated with their experience. Key findings from the research brief are summarized briefly in Exhibit 1.

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 and rural educators.<sup>3</sup> 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?*

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<sup>2</sup> See <http://www2.ed.gov/programs/dropout/learningsupports092414.pdf>

<sup>3</sup> See the appendix of this brief for additional information about the methods used to collect and analyze practitioners' perspectives.

## Exhibit 1. Key Findings From the Review of Research on Supplementary Learning Supports

A review of rigorous research on supplementary learning supports to promote student success in Algebra I found that double-dose algebra and ELOs can demonstrate positive outcomes but that these outcomes depend on important implementation factors.

### **Double-dose algebra programs** may:

- Improve algebra test scores (PLAN and ACT), graduation rates, and college enrollment rates, but there is no evidence for improved overall passing rates across the district, as implemented in Chicago Public Schools.
- Change the peer composition and context of Algebra I classrooms if students are grouped into the course on the basis of prior achievement.
- Have less educational benefit for student learning than alternative models that use the same amount of extra instructional time to focus on preparing students with foundational skills for Algebra I.

### **Expanded learning programs** may:

- Improve algebra readiness, test scores, and math achievement.
- Produce larger impacts when they combine an academic and a social focus instead of focusing strictly on academics.
- Have limited or no impact if the quality of implementation suffers and participation rates are low.

As summarized later in this perspective brief, none of the key findings from the research brief (see Exhibit 1) surprised district math leaders or Algebra I teachers, and most research findings resonated with their experience. Participants in the focus groups also provided insight and suggestions for high-quality implementation based on their experience.

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

- Students fail Algebra I for a host of reasons, both academic and non-academic. Supports for struggling students need to be multifaceted—emphasizing both student preparation for Algebra I and broader motivation and engagement with school. Teachers also need the resources to assess students' unique learning needs and tailor instruction appropriately.
- Although the research on ELOs has identified the importance of incorporating a social focus in ELOs along with the components of high-quality academic programming, practitioners also suggested the importance of parental involvement.

- Extra instructional time for struggling students must be intentionally structured, using high-quality curricula administered by the highest quality teachers, and these supplementary programs and teachers must be provided sufficient resources and professional development to accomplish the tall order of moving at-risk students toward success in Algebra I.
- The success of both double-dose algebra and ELOs depends on sustainability and consistent leadership, high-quality professional development, and vertical alignment and collaboration across grades and schools.

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.

# Participants' Perspectives on the Research

The following sections highlight the perspectives of district math leaders and Algebra I teachers that emerged from the 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, focusing first on research topics unique to double-dose algebra—the predominant focus of their conversations—and second on research topics unique to expanded learning opportunities. For each section, we begin with a brief overview of the relevant research findings followed by an exploration of key themes from the focus group participants' reactions to the research. Although double-dose algebra and ELOs differ in their structure (in-school time, out-of-school time) and focus, we highlight cross-cutting themes that emerged in focus group discussions about both double-dose algebra and ELOs in a subsequent section. In the last section, we highlight implications for program developers and administrators.

## DOUBLE-DOSE ALGEBRA

Despite widespread use of double-dose instruction, nearly all of the strongest evidence to date assessing the effectiveness of this strategy comes from Chicago Public Schools. Chicago's double-dose policy, implemented formally from 2003 through 2006, required first-time ninth graders testing below the national median on the mathematics section of the Grade 8 Iowa Tests of Basic Skills (ITBS) to enroll in two concurrent periods of algebra—a full year of Algebra I plus a full-year algebra support class.

Research on Chicago's policy shows that double-dose algebra did improve test scores, including the Grade 10 preliminary ACT (called PLAN) and the math portion of the ACT (Grade 11), but did not result in improved overall passing rates for the district—a primary objective of the double-dose policy (see Cortes, Goodman, & Nomi, 2013; Nomi & Allensworth, 2009). Neither district math leaders nor algebra teachers who participated in the focus groups were surprised by these findings. Respondents from both groups were quick to point out that, consistent with the research findings, students just above the median who were previously average-performing students in a regular Algebra I course would become, under this policy, the lowest performers in their Algebra I course because their lower-performing peers will be assigned to a separate Algebra I course and a corresponding support-period. Respondents also agreed with the research findings that any improvement observed among students below the median who received double-dose algebra would likely be offset by increased failure rates for students just above the median who might now face more challenging learning environments in a regular Algebra I course with higher performing peers.

District math leaders also emphasized that interpreting passing rates across a district and across students can be difficult if these courses do not use a standardized grading metric. Schools and teachers within the same district may be using inconsistent standards for determining whether students have mastered Algebra I content when assigning grades. This problem is exacerbated if schools and teachers are calibrating these standards differently for classes with higher and lower performing students. For these reasons, district leaders underscored the importance of a consistent grading metric—based on mastery of concepts—if a district is assessing improvement in Algebra I passing rates.

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*Double-dose algebra courses designed to support struggling students need to squarely address the wide range of reasons that students often do not succeed in the course.*

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Although adopting standardized grading metrics would increase a district's capacity to interpret improvements in Algebra I passing rates, all participants agreed that double-dose algebra courses designed to support struggling students need to squarely address the wide range of reasons that students often do not succeed in the course.

Both district math leaders and algebra teachers shared their insight into why students struggle to pass Algebra I. Their perspectives focused generally on two themes: (1) student preparation for Algebra I; and (2) student engagement and motivation in school.

## *Student Preparation for Algebra I*

Grades and test scores aside, district math leaders and teachers agreed that many students who enter Algebra I are simply unprepared for the course, lacking the prerequisite skills. As one teacher noted, "Everything goes back to basic skills and simply number sense. They don't have that number sense, working with negative and positive integers, multiplication of fractions, and division of fractions, percent and decimals."

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*Program developers may want to consider whether and how their double-dose courses will address students' proficiencies—do they need more time for enriched Algebra I learning or do they need time to further develop general math skills?*

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Similarly, one district math leader asked, "Are they not passing because they're not [competent in] basic arithmetic and fluency? Are they getting algebra but failing because they can't do  $\frac{1}{4}x = 8$ , but they can do  $2x = 8$ ?" These concerns raised important questions for both district leaders and algebra teachers about the goal of a second period—is it to provide more time to grapple with Algebra I concepts, or is it to repair basic math skills essential for success in Algebra I? Program developers may want to consider whether and how their double-dose course will address

students' proficiencies—do students need more time for enriched Algebra I learning or do they need time to further develop general math skills—number sense, fractions and so on?

One research study highlighted in the research brief shed some light on this question by examining the benefit of using extra instructional time to focus on building foundational skills relative to a standard double-dose model (where extended instructional time is focused on Algebra I). The study found some favorable results. Ninth-grade students who took a Transition to Advanced Mathematics (TAM) course, who had half the exposure to algebra-specific content but more exposure to general math skills than double-dose students, demonstrated comparable algebra skills and better general math skills (Sweet, 2010).

Participants in the focus groups did not address this TAM approach directly or state firm opinions about how to best use a second period, but multiple teachers reported using similar approaches with extra instructional time. For example, one teacher described implementing a course with pre-algebra students to build skills and basic competencies, and another reported using an online program that she believes fostered notable improvements in number sense and basic skills.

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*Practitioners emphasized the need for vertical alignment and collaboration across grades and schools rather than relying exclusively on double-dose algebra courses to address deficits in prior math skills.*

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When students are underprepared for Algebra I, double-dose algebra teachers need to address many different limitations in students' basic math proficiencies. Both district administrators and algebra teachers emphasized that initiatives focused on supporting struggling students cannot rely exclusively on double-dose algebra to address prior deficits. These efforts need to be coupled with vertical alignment and collaboration across grades and schools. The sequencing of learning is covered in detail in separate research and perspective briefs<sup>4</sup> as part of this project,

but this set of focus group participants underscored the importance of vertical alignment and collaboration in conjunction with a double-dose algebra program to help struggling students succeed in Algebra I.

One administrator explained that if a district had resources to devote to promoting student success in Algebra I, they should devote 75 percent toward the early and middle grades—4, 5, and 6—to focus on building core proficiencies in fractions, decimals,

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<sup>4</sup> For a review of research, see Curricular Alignment to Support Student Success in Algebra, <http://www2.ed.gov/programs/dropout/curricularalignment092414.pdf>. For perspectives of district math leaders and Algebra I teachers, see [curricularalignmentperspectivebrief.pdf](http://www2.ed.gov/dropout/curricularalignmentperspectivebrief.pdf), <http://www2.ed.gov/dropout/curricularalignmentperspectivebrief.pdf>.

percentages, part-to-whole ratios, and other areas. A teacher similarly argued, “Let’s not make ninth-grade teachers miracle workers” for problems that were likely cascading from prior years.

When asked what effective vertical collaboration would look like in practice, teachers suggested having regular cross-building meetings; sharing textbooks, resources, and materials across grades and buildings; and even providing financial support for teachers to co-teach a few lessons to students above and below their grade level. Teachers underscored the importance of developing a shared understanding of the sequencing of

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the learning that comes both before and after the content they teach, as well as creating a common language so that learning across grades feels connected for students.

Focus group participants also emphasized that students struggle with algebra for many reasons, and implementing a “one-size-fits-all” approach may not provide the range of learning supports that students need to succeed. To help students succeed in algebra, double-dose algebra teachers need tools to help them assess student-specific learning deficiencies. These challenges

may be particularly demanding in both urban and rural districts with limited resources and personnel. Indeed, one rural district math leader expressed concerns about the capacity of his/her district’s school to assess the problem for each student, individualize instruction, and effectively fill that gap to help all struggling students get on track.

To overcome these barriers, both urban and rural teachers and administrators described the benefits of an online program they currently use that employs artificial intelligence and open questioning to identify precisely what each student does and does not know. One district leader explained that this online assessment program really helped teachers to identify student needs, fill those gaps, and get students back on track to focus on Algebra I. The program allowed teachers to quickly identify a specific skill deficiency (e.g., rational numbers) and pull those students aside for a small workgroup lesson while other students continued to use the program, thus providing targeted support for struggling students.

In short, effective double-dose algebra programs need to be coupled with vertical alignment and collaboration to support student preparation for Algebra I but also need to provide double-dose algebra teachers the resources and supports they need to assess students’ unique learning needs and tailor instruction appropriately. However, as detailed next, these efforts may be ineffective if they do not also address the reasons that many struggling students disengage from school more generally.

## Student Engagement and Motivation in School

Although specific proficiencies are critically important to success in Algebra I, participants in the focus groups also emphasized that sometimes struggling to succeed in algebra may have less to do with prior preparation in mathematics and more to do with broader

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*Students need to develop the basic skills necessary for success in Algebra I, but students who fail Algebra I often fail other courses too, and the root of the problem is sometimes not a math-specific competency but a motivational and engagement challenge.*

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participation and engagement in school. Focusing instructional time on developing basic math skills or on Algebra I may not help struggling students succeed if these challenges are not the root of the problem.

One district math leader emphasized that social and emotional learning in every classroom is critically important for cultivating positive behavior and student engagement, but also added that these challenges are especially difficult in math: “By this time in a student’s schooling career... [students] may have built certain adverse reactions to mathematics...so part of it is... building...self-esteem and motivation to be able

to do the mathematics, while at the same time actually teaching the mathematics and repairing.” Another district math leader suggested that teachers need to not only focus on math practices and standards but also teach students “grit” (i.e., sticking with things over the long term) and resiliency.

In addition to cultivating motivation and confidence in mathematics, one district math leader felt that teachers need to connect math to what students care about to make math meaningful, asserting, “If we could do better as educators in really getting to know our students and seeing what it is that excites them, what they’re passionate about, then tie mathematics to that.”

Participants also emphasized the need to help students learn how to function well academically—helping them recognize when to ask questions if they do not understand new material and learn to be okay with struggling when the course feels difficult. Some administrators and teachers reported implementing programs and interventions that focus specifically on cultivating skills for academic success (e.g., organizational and note-taking skills).

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*“It is about the relationship with the kids, especially with your struggling students. If they can build a strong relationship with a teacher, they’re going to perform for that teacher.”*

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*–District math leader*

Finally, both district math leaders and algebra teachers emphasized that teachers need to build relationships with struggling students to be able to motivate and engage them in course content. One teacher asserted that “connections [with students] are the most important part of being a successful teacher. If you don’t connect with your students, they won’t perform for you. And kids that aren’t as high achieving—if you can make connections with them, they will transcend where they’ve been.”

Similarly, a district math leader explained, “It is about the relationship with the kids, especially

with your struggling students. If they can build a strong relationship with a teacher, they’re going to perform for that teacher.”

In short, focus group participants emphasized that struggling students often need supports that go beyond developing math skills and understandings by focusing on students’ confidence, engagement, and connection to school. Double-dose algebra programs can explicitly address these challenges, or can be implemented in conjunction with other interventions that do so.

## *Summary of Perspectives on Double-Dose Algebra*

In summary, practitioners’ perspectives on double-dose algebra and related research shed light on the challenges that educators face when using a double-period algebra course to help struggling students succeed. Course placement policies can undermine the benefits of these support strategies and should be structured to minimize grouping by prior performance. Double-dose algebra programs cannot solely address deficits in prior math skills and should be coupled with vertical alignment and collaboration across grades to ensure student preparation for Algebra I. Further, the challenges that double-dose algebra students face are diverse, and a “one-size-fits-all” strategy to prevent failure for struggling students may not be effective. Administrators and teachers make clear that these supplementary learning strategies require effective tools for identifying student-specific needs and require time and resources to individualize instruction appropriately. Finally, schools may need to incorporate programs or interventions that explicitly address engagement and participation in school more generally as well as the skills that all students need to succeed academically. In the next section, we highlight practitioners’ perspectives on expanded learning opportunities and key findings from supporting research.

## EXPANDED LEARNING OPPORTUNITIES

Research on expanded learning programs, including afterschool and summer school programs, has shown positive outcomes for students, including improved algebra readiness, standardized test scores, and math achievement (see Lauer et al., 2006; Redd et al., 2012). However, this research also makes clear that impacts (1) are larger

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*Practitioners strongly agree with research asserting that expanded learning opportunities should incorporate not just an academic focus but also a social focus on improving student motivation and confidence in mathematics.*

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when programs include not just an academic but also a social focus, and (2) depend on a host of implementation factors (many of which are not unique to ELOs but could also apply to double-dose algebra).

Both of these key research findings strongly resonated with district math leaders and algebra teachers' experience in implementing similar programs. One district math leader described implementing a successful summer program that focuses 40 percent of the time on math and 60 percent of the time on "self-efficacy

[i.e., believing you can complete tasks and achieve goals], grit, and resilience...You hear video interviews and these students believe in themselves and they see themselves as learners."

Focus group participants also highlighted the stigma and challenges that struggling students face and the importance of leveraging these opportunities to not only build proficiency in algebra but also improve students' motivation and confidence in mathematics. One teacher provocatively asked, "How would you like to be a 15 or 16 year old going over your multiplication facts? Learning how to do fractions? There's so much you're overcoming with children at this age that I think to [overcome these barriers] in isolation [with] content alone is to sometimes do more harm than good because you're certainly not teaching that student how to get to calculus."

Both district math leaders and algebra teachers also strongly agreed with research asserting that high-quality implementation is critically important to the success of ELOs, including recruiting and selecting qualified staff, ensuring that programs are intentional and focused by using manuals or an established curriculum, providing individualized attention to students through tutoring and mentoring, conducting regular observations, using targeted age-appropriate programming, providing structure and clear expectations to participants, using culturally competent materials, and monitoring performance.

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*The impact of ELO programs depends critically on student attendance. ELOs should incorporate key features of high-quality implementation and engage students by providing them a range of enriching educational opportunities to choose from.*

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Because attendance at afterschool programs is sometimes optional, focus group participants reported that it is important that students commit to participating in these programs for them to have a positive impact. Participants suggested that offering a range of educational opportunities for students to choose from can bolster attendance in ELOs—students are more likely to engage in activities they select for themselves. For example, an afterschool program at one of the participants' district offers students multiple educational experiences to choose from, including one focused on general math games targeting number sense and another using an online

program focused on mental math games to help engage students and instill “positive feelings about mathematics.”

## *Summary of Perspectives on Expanded Learning Opportunities*

In summary, focus group participants affirmed findings presented in the research brief on implementing effective ELOs—particularly the importance of a social focus on cultivating confidence and positive feelings about mathematics—and added that providing students some choice over their educational opportunities can facilitate buy-in, participation, and attendance.

In the next section we highlight a range of cross-cutting perspectives on providing support for implementation of a double-dose algebra course and/or an expanded learning program designed to support struggling algebra students.

## **CROSS-CUTTING PERSPECTIVES**

A central question in both research and practice on double-dose algebra and ELOs is how to structure extra instructional time in ways that provide students the resources they need to succeed. We asked focus group participants to provide insight on the ways districts and schools can best support implementation of supplementary learning strategies. Both district math leaders and algebra teachers emphasized the importance of the following:

- High-quality curricular and instructional resources
- Professional development to support the use of extra instructional time
- Teacher continuity and quality
- Sustainability and continuity in leadership and reform efforts
- Family involvement

Focus group participants asserted that high-quality curricular and instructional resources are important to the success of both double-dose algebra courses and ELOs. The algebra teachers described a wide range of course formats and curricular resources for double-dose instruction in their schools. For example, one teacher described resources and materials similar to those used in Chicago; one noted using a “stretch algebra” model in which Algebra I was stretched out over two years, and another indicated that the extra period is often used as a study hall with no specific curriculum resources. Despite these differences, teachers universally agreed that establishing a set of curricular materials

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*—Algebra teacher*

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and resources to guide extra instructional time is critical. One teacher explained, “I thought it was really important that there were [curricular] materials for teachers to use, because we found that there were a lot of invested teachers, but we aren’t all curriculum creators. There is a lot of work that goes into [developing] it.”

Teachers and district math leaders also stressed the importance of training and professional development on how to effectively use extra instructional time in double-dose algebra or ELOs. High-quality curricular and instructional resources are only useful if teachers are well trained in how to use them effectively.

In addition to providing high-quality curricular resources, and providing professional development to support the implementation of double-dose courses and ELOs, the algebra teachers in the focus group strongly emphasized that districts and schools should only assign their strongest teachers to Algebra I, double-dose algebra, and ELOs. Because some schools provide their most experienced teachers first choice over which classes they teach, the most inexperienced teachers may be assigned to teach double-dose algebra or implement ELO programs. One teacher noted that high-quality curricular resources and training can be “fabulous in theory” but may fail if the teachers are not committed to or not experienced in supporting struggling students. Although teachers did

not define what makes a strong algebra teacher, these teachers may have a demonstrated history of engaging struggling students and implementing instructional practices that support both procedural fluency and conceptual understanding.

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Algebra teachers also emphasized the benefits of continuity for students between their teacher for double-dose algebra/ELOs and their regular Algebra I teacher. Some districts and schools offer the support period as a separate course with a different teacher. Indeed, one district math leader noted that the district intentionally structured its double-dose course so that students have a different teacher for Algebra I and the second support period, as a way to provide complementary perspectives. However, algebra teachers in the focus group argued that students

benefit more from continuity. One algebra teacher asserted that she is more invested in her students' success than a separate teacher would be who comes in only for the double-dose period: "I think the kids need to be with me. Also, the kids are with their same peers, which I think is important—that they're with the same group of kids." Another teacher agreed, arguing for continuity across classes for students if only to avoid the communication challenges between two teachers—the need to communicate on a daily or weekly basis with one another about what is being covered, which students are struggling, and what they need to succeed.

Program developers and administrators may want to carefully consider the advantages and disadvantages of ensuring teacher continuity across math courses and afterschool or summer programming. One district math leader argued that students are more likely to show up and participate in summer programs when the ELO teacher will be their teacher in the coming fall and when their prior-year teacher encourages them to enroll in the program. This district leader also explained that students who participated in a summer ELO program in prior years are often brought back to participate in a pep rally and "speak about how powerful [the summer program] was for them," emphasizing that success depends on student buy-in garnered through relationships with teachers.

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*Both district math leaders and algebra teachers expressed deep concern about what they perceived as constant change in district and school leadership and programming, and the negative effect this can have for initiatives like double-dose algebra and ELOs.*

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In addition to providing high-quality curricular resources and professional development and selecting the strongest teachers, district math leaders and teachers alike asserted the importance of sustainability and continuity in school and district leadership and their reform initiatives. One teacher explained, “It seems like a lot of that momentum is lost because...when you get new [superintendents], things change and initiatives lose ground, budgets are cut. So I honestly don’t even know the status right now of double-dose algebra in our district, but I did see the success.” Similarly, expressing that some great programs are discarded prematurely, a district math leader explained, “We think of some really great ideas and strategies, but they don’t live long enough to actually know that you did a good job...we’ll never know...because everything we’re going to do is always going to be a start-up that lasts, at max, two to three years, and then by the time you actually really find the long-term effects of it, you’re on to something else probably two or three times removed.”

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*“We think of some really great ideas and strategies, but they don’t live long enough to actually know that you did a good job.”*  
—District math leader

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District leaders agreed that when a school or district makes the decision to invest in a strategy, they need to give it time to reach its potential. In one administrator’s words: “It’s not going to be perfect and you’re going to have to make tweaks and adjustments based off of the data and the evaluation that start to come out in the intermediate and long-term.” This perspective underscores the importance of adopting a continuous improvement approach whereby districts and schools continuously evaluate and refine strategies to support struggling students rather than abandoning current practices for new ones that may be no more or less effective.

Finally, algebra teachers in the focus group stressed the important role that parents and family play in supporting struggling students and encouraging persistence and success in Algebra I. One teacher suggested that parents need to understand what teachers are trying to do with their kids—to appreciate the importance of mathematics—and that when students see their parents involved, they too will become more engaged in school. Further, a teacher explained that in the teacher’s own community, parents sometimes undermine teacher and school efforts to engage students in math by telling their children that math is not important. Capturing these sentiments well, this teacher asserted that math is undervalued relative to reading, noting, “[Parents are] really quite sure that their child doesn’t in fact need to know math. They tell the kids ‘I didn’t pass that either. I don’t need that. You don’t need that. It really doesn’t matter.’ ...It’s hard to get

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*Parents can undermine efforts to support struggling students if they communicate that algebra is not important to their futures.*

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[students] to change their mind... They believe their parents. I just think there needs to be as much of a stigma of not knowing any algebra at all as there is for not knowing how to read. Our people never say 'I can't read, and it's perfectly fine.' I want the commercials on TV. I want the ads in the newspapers. I want us to look every bit as important as reading."

In short, teachers and administrators agreed that parents and family need to be included in initiatives to support struggling students, if only to be aware of what educators are doing and prevent undermining their work.

## *Summary of Cross-Cutting Perspectives*

In summary, focus group participants provided useful insight into how districts and schools can best support the implementation of programming and courses designed to help struggling algebra students succeed. These courses or ELO programs should provide high-quality curricular and instructional materials, as well as professional development to support effective use of additional instructional time, and select their best teachers to work with struggling students. Districts and schools should also work with parents and families to help them understand what teachers are doing with their students and why, to ensure that parents are supporting, not undermining, efforts to engage their child in algebra and mathematics. Finally, districts and schools should provide adequate time for programs to succeed and should avoid frequent changes to leadership and reform efforts.

# Implications for Program Developers and Administrators

Findings from the analyses of the focus group data provide useful information for program developers and administrators who are working to design and implement double-dose algebra and ELO programs. Although the practitioners often agreed with the research findings, they did expand on that research with insights from their own experiences. As program developers and administrators consider developing and implementing double-dose algebra and ELO programs, 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 and identifies potential implications to consider.

**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
<p>Course placement policies can support or undermine supplementary support programs.</p>	<ul style="list-style-type: none"> <li>• Assign students to programs in ways that minimize grouping by prior performance (e.g., offer supports to all students).</li> <li>• Identify possible unintended consequences of your course placement policies.</li> <li>• Make sure your course placement policies provide all—not just some—students the supplementary supports they need to succeed in Algebra I.</li> <li>• Implement standardized grading metrics that accurately reflect what students learn in Algebra I.</li> </ul>
<p>Students may not succeed in Algebra I for a host of reasons, some of which can have little to do with prior math preparation.</p>	<ul style="list-style-type: none"> <li>• Provide teachers necessary resources for assessing student gaps in the basic math skills critical to success in algebra.</li> <li>• Ensure that the mathematics curriculum is vertically aligned across grades and schools so that students are adequately prepared for Algebra I.</li> <li>• Assign appropriate interventions and programs to students based on their unique individual needs.</li> <li>• Provide students the resources and supports they need to become effective students and to feel engaged and motivated in school.</li> <li>• Encourage teachers to develop positive relationships with struggling students.</li> </ul>

Key Focus Group Findings	Considerations for Program Developers and Administrators
<p>Effective expanded learning programs require high-quality implementation, and incorporate both an academic and a social focus to enrich student learning.</p>	<ul style="list-style-type: none"> <li>• Select qualified staff.</li> <li>• Use manuals or curricula for focused program activities.</li> <li>• Provide individualized attention and support to students.</li> <li>• Set clear expectations and establish structure for participants.</li> <li>• Use age- and culturally-appropriate materials.</li> <li>• Incorporate regular observations by senior staff, and monitor progress.</li> <li>• Provide students academic options to facilitate buy-in and participation.</li> <li>• Incorporate a social focus to cultivate student motivation and confidence in algebra and mathematics.</li> </ul>
<p>Districts and schools can play an important role in supporting effective use of extra instructional time to help struggling students succeed.</p>	<ul style="list-style-type: none"> <li>• Provide high-quality curricular and instructional resources and professional development to teachers focused on how to use additional instructional time with students.</li> <li>• Select your strongest teachers to teach courses designed to support struggling students.</li> <li>• Avoid frequent shifts in district and school leadership and reform efforts.</li> <li>• Provide existing programs sufficient time to flourish.</li> <li>• Maintain a consistent approach to improving success in Algebra I.</li> <li>• Help parents understand what your math teachers are doing with students and why it is important to ensure that parents support these efforts.</li> </ul>

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## Appendix

To examine how district policymakers and teachers use and make sense of research on supplementary supports for struggling students, the project team convened a group of experienced district math leaders (including math coordinators, district math 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 which 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 (OESE) and AIR ultimately selected seven of the 14 districts (five urban, 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 math, 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). Following 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, with disagreements resolved to agreement. Findings from these analyses form the basis of this perspective brief, with the goal of documenting 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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