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Taking Stock of Common Core Math Implementation: Supporting Teachers to Shift Instruction

Insights from the Math in Common 2015 Baseline Survey of Teachers and Administrators

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WestEd's Evaluation of the Math in Common Initiative

Math in Common® is a five-year initiative funded by the S.D. Bechtel, Jr. Foundation that supports a formal network of 10 California school districts as they are implementing the Common Core State Standards in mathematics (CCSS-M) across grades K–8. Math in Common grants have been awarded to the school districts of Dinuba, Elk Grove, Garden Grove, Long Beach, Oakland, Oceanside, Sacramento City, San Francisco, Sanger, and Santa Ana.

WestEd is providing developmental evaluation services over the course of the initiative. The evaluation plan is designed principally to provide relevant and timely information to help each of the Math in Common districts meet their implementation objectives. The overall evaluation centers around four central themes, which attempt to capture the major areas of work and focus in the districts as well as the primary indicators of change and growth. These themes are

- Shifts in teachers' instructional approaches related to CCSS-M in grades K–8.
- Changes in students' proficiency in mathematics, measured against the CCSS-M.
- Change management processes at the school district level, including district leadership, organizational design, and management systems that specifically support and/or maintain investments in CCSS-M implementation.
- The development and sustainability of the Math in Common Community of Practice.

Together, the Math in Common districts are part of a community of practice in which they share their progress and successes, as well as their challenges and lessons learned about supports needed for CCSS-M implementation. Learning for district representatives is supported by WestEd team members who provide technical assistance related to goal-setting and gathering evidence of implementation progress (e.g., by advising on data collection instruments, conducting independent data analyses, participating in team meetings to support leadership reflection). An additional organizational partner, California Education Partners, works with the community of practice by offering time, tools, and expertise for education leaders to work together to advance student success in mathematics. California Education Partners organizes Leadership Convenings three times per year, summer Principal Institutes, "opt-in" conferences on high-interest topics (e.g., formative assessment), and cross-district visitation opportunities.

Executive Summary

In spring 2015, WestEd administered surveys to understand the perspectives on Common Core State Standards–Mathematics (CCSS-M) implementation of teachers and administrators in eight California school districts participating in the Math in Common (MiC) initiative. From this survey effort, we were able to learn from over 1,000 respondents about some of the initial successes and challenges facing California educators attempting to put in place and support new—and what some consider revolutionary—ideas in U.S. mathematics education. The primary survey findings presented in the report are as follows:

- Teachers and administrators are confident in their mathematical content knowledge to support CCSS-M, and the majority report that CCSS-M is having a positive effect on teaching and learning. Despite this self-perception of strong mathematical content knowledge, translation of CCSS-M into classroom instruction is, as expected, a more difficult sticking point of implementation: teachers do not feel prepared to develop their lesson and unit plans aligned to CCSS-M content and administrators feel less prepared to support the practical classroom implementation of CCSS-M (e.g., providing effective instructional models for teachers) than to support other aspects of implementation (e.g., prioritizing CCSS-M implementation activities at the school site).
- Teachers are less positive than administrators that they have the resources needed to align their instruction with CCSS-M. Teachers also indicate mixed levels of confidence in their district's process for determining whether supplemental curriculum materials or changes are needed. Only about a third of teachers agree that their curriculum materials ensure access to CCSS-M for students with disabilities.
- Teachers' most frequent opportunities to learn about CCSS-M have involved presentations by "expert" presenters, with less frequent opportunities for more active, classroom-focused activities. While teachers report receiving support for monitoring student understanding during mathematics instruction (i.e., a part of the formative assessment process), they want more frequent opportunities to examine classroom instruction and jointly discuss how instruction needs to shift to reach the new standards.
- Additionally, teachers report that the most limited area of support from professional development has been preparation to teach all students to be successful, especially those with special needs. Administrators similarly register concern about teacher training to support special student populations, ensure access, and integrate CCSS-M with programs serving special populations.

The Common Core State Standards are not "old wine in new bottles," but a new way of conceptualizing mathematics and mathematics instruction. However, earlier lessons learned about the difficulties of implementing mathematics reform continue to apply. For one, successful CCSS-M implementation requires district leaders to envision (or re-envision) what constitutes good teaching in mathematics classrooms across grade levels, and to support district educators in understanding and realizing that vision by drawing on instructional materials, ongoing learning opportunities, and data that indicate progress on a clear set of indicators. Specifically, the survey findings suggest three main areas that the MiC districts will likely want to focus on to help ensure effective ongoing implementation of the CCSS-M:

1. **Professional Learning:** MiC districts may need to organize additional job-embedded professional development for teachers and administrators at the school-site level, such as professional learning communities, instructional walk-throughs, and job-embedded coaching. Such professional development might focus not just on CCSS-M content, but on understanding that effective CCSS-M instruction involves an *interplay* of content, pedagogical practices, and needs of specific learners and groups of learners. Such professional development

opportunities would enable district mathematics staff to more frequently solve mathematics problems together; discuss connections of mathematical content across grade levels (e.g., how unit iteration relates to fractions and proportional reasoning); observe and discuss classroom instruction; and discuss the rationale behind instruction embedded in lesson or unit plans or seen live in the classroom. We note that resources to support teacher effectiveness have recently been supported by Governor Jerry Brown and the state Legislature. In June 2015, $500 million was allocated in the upcoming state budget for a range of programs to provide teachers with professional development and the support they need to implement the Common Core State Standards.

2. **Curriculum:** The survey results suggest that MiC districts should evaluate needs and clarify current policy and practice related to effectively adopting, purchasing, using, and aligning instructional materials with the CCSS-M. Districts may need to re-examine curriculum materials to assess whether the materials are sufficiently educative for teachers to understand the grade-level mathematics content they need to teach to their students and how the content fits within cross-grade learning trajectories. Districts will also need to assess whether the materials support learning for all students. Teachers may need additional supports to better use their materials in a way that is aligned with CCSS-M, especially in support of their special needs students. Existing materials may need to be modified, improved upon, or replaced to better align with CCSS-M.[1]

3. **Monitoring Effectiveness:** MiC districts need to continue to regularly assess educational inputs, outcomes, and processes to monitor implementation efforts in light of the districts' theories of change and to make course corrections, as necessary, toward district goals. This sort of monitoring will require attention to the interim and formative assessments used to understand student learning. In addition, more broadly, this sort of monitoring will require districts to set clear goals in all areas of CCSS-M implementation, understand teachers' and administrators' roles in attaining those goals, and document progress with reliable indicators that clearly demonstrate change or lack thereof. For example, MiC leaders have made excellent progress in thinking about data collection systems to understand relationships between professional development and classroom instruction (e.g., developing observation protocols that specify whether observed teachers are implementing instructional strategies such as "number talks"), but more effort is needed to incorporate feedback from teachers; obtain a clear picture of how teachers enact the district's vision for mathematics education; and gain clarity on exactly what the impact of the CCSS-M is on teaching and learning and whether the impact of the standards is indeed positive, as most teachers report. Similarly, the summer 2015 release of the student results from the first Smarter Balanced operational assessment provides an opportunity for districts to review student results in light of other district activities to promote effective CCSS-M implementation and consider where to direct additional resources and supports.

Another lesson from prior education reform efforts is that it will take significant time and concerted effort—what Richard Elmore and Milbrey McLaughlin referred to as "steady work" (1988)—before the changes required by CCSS-M will be widely observed in teaching and learning throughout the MiC districts. Through this survey effort, we learned that educators need time and additional support to continue to make progress in CCSS-M implementation, and the survey results offer several implications for the kinds of site and district planning that might be warranted to help educators make this progress. In 2016, we will administer another survey to check back in with educators in these districts to get their opinions on the progress they are able to make in the upcoming year.

1 While the survey results suggest the need for curriculum revisions, evidence from our ongoing interactions with the MiC districts since the 2015 survey administration show that CCSS-M implementation is often a moving target and that MiC districts have already made progress in this area. For example, three districts adopted new curriculum during the 2014–15 school year, but will not begin to use the curriculum until the 2015–16 school year. Survey responses from teachers in these districts may have reflected dissatisfaction with access to CCSS-M materials that has already been addressed by district implementation efforts.

Introduction

Although the Common Core State Standards–Mathematics (CCSS-M) were created through research-based information about how students' knowledge, skills, and understanding develop over time, the standards do not—and cannot—provide teachers with specific instructional steps to help students achieve mastery of the standards. Rather, the standards are meant to be interpreted and implemented by teachers, educators, and administrators—working within their schools and school districts across the 43 states that have adopted the CCSS—to support the success of their particular students.

This lack of prescription means that implementation of the CCSS—and the steps undertaken in different locations to support students' success in mastering the standards—will look quite different across states or among the districts, schools, and teachers within a single state. CCSS-M implementation could thus be likened to the old parable of blind men touching and describing an elephant: what each interpreter deems important may be the truth that *they* emphasize, but may be only part of the complete picture. Implementation of any new idea in education is uncertain because actions are determined by individuals interpreting ideas and operating in ways that make sense to them in their unique organizational contexts (Berman & McLaughlin, 1978; Coburn, 2003; Cohen & Hill, 2001; McLaughlin & Talbert, 2001; Perry, 1996; Spillane, 1998). Innovations without clarity of content and the processes needed to bring the central reform ideas to life are often particularly likely to be implemented in unpredictable ways and look little like what was originally intended (Berman & McLaughlin, 1978; Brown & Campione, 1996; Coburn, 2003; Coburn & Stein, 2010; Cohen, 1990; Design-Based Research Collective, 2003; Flay et al., 2005; Fullan, 2001; Gutierrez & Penuel, 2014; Penuel & Fishman, 2012).

Knowing how individual stakeholders within the district view and act in support of the CCSS-M enables district administrators to better understand and assess how well the beliefs and actions of district staff align with the district's overall CCSS-M implementation plan, and can inform adjustments to the implementation plan along the way.

CCSS-M IMPLEMENTATION SURVEY

In support of the Math in Common (MiC) initiative, WestEd is helping the district grantees better understand their respective implementation efforts and where there are clear areas for improvement or more concerted efforts. To that end, in spring 2015 WestEd designed and administered surveys to three stakeholder groups in the MiC districts: K–8 mathematics teachers, school administrators, and district administrators. The surveys focused on several key implementation areas, including professional learning opportunities, vision for CCSS-M implementation, curriculum and instruction, preparedness to enact and implement the CCSS-M, and respondents' background. The surveys included Likert-scale items asking respondents to rate the extent to which they agreed or disagreed with statements about CCSS-M; forced-choice items (e.g., on instructional materials use); and open-response items asking respondents to elaborate on opinions about the CCSS-M (e.g., regarding needs for effective implementation or expectations about their district and school related to CCSS-M implementation).

The survey was designed to measure what respondents thought about various aspects of their districts' implementation of the CCSS-M. In addition, we aimed to understand the current supports for and/or challenges to CCSS-M implementation and sustainability broadly across the MiC community. As one of the first large-scale survey data collection efforts related to CCSS-M implementation across California districts,

we also hope the results can inform state policy and help other districts better understand CCSS-M implementation processes.

We gathered responses from 990 teachers, 122 site administrators, and 33 district administrators from across eight MiC districts (two MiC districts opted out of participating in the surveys). From this survey effort, we were able to learn about some of the initial successes and challenges facing California educators attempting to support and put in place new—and what some consider revolutionary—ideas in U.S. mathematics education.

To contextualize the survey findings, the authors drew upon our experience working closely with the MiC districts over the course of the last year. Specifically, we selected examples to illustrate a variety of ways in which MiC districts are providing support for CCSS-M implementation. We do not intend for these examples to be "silver bullet" solutions to a given type of implementation issue; each district's unique context plays a role in how its educators implement the CCSS-M. By including descriptive examples of CCSS-M implementation along with the survey results, we hope to not only support further conversations in and across MiC districts about how to continue to make forward progress with the CCSS-M, but to also enable other concerned districts and educators to learn from this small group of diverse districts.

These survey results are limited in scope and generalizability; they are a snapshot in time. But they can give voice to MiC district staff, allowing them to participate as active partners if the data are used to plan for and support subsequent actions. Additional information about the survey methodology, including response rate and limitations, can be found in Appendix A.

Highlights from the Survey Findings

In this section, we present selected survey findings describing CCSS-M implementation in the MiC community. Our discussion of the findings is primarily focused on the responses from our robust sample of teacher respondents about their perceptions, learning, and needed supports. Additional survey findings will be shared in forthcoming Math in Common publications.

EDUCATORS' THOUGHTS ON MATHEMATICS AND THE COMMON CORE STATE STANDARDS

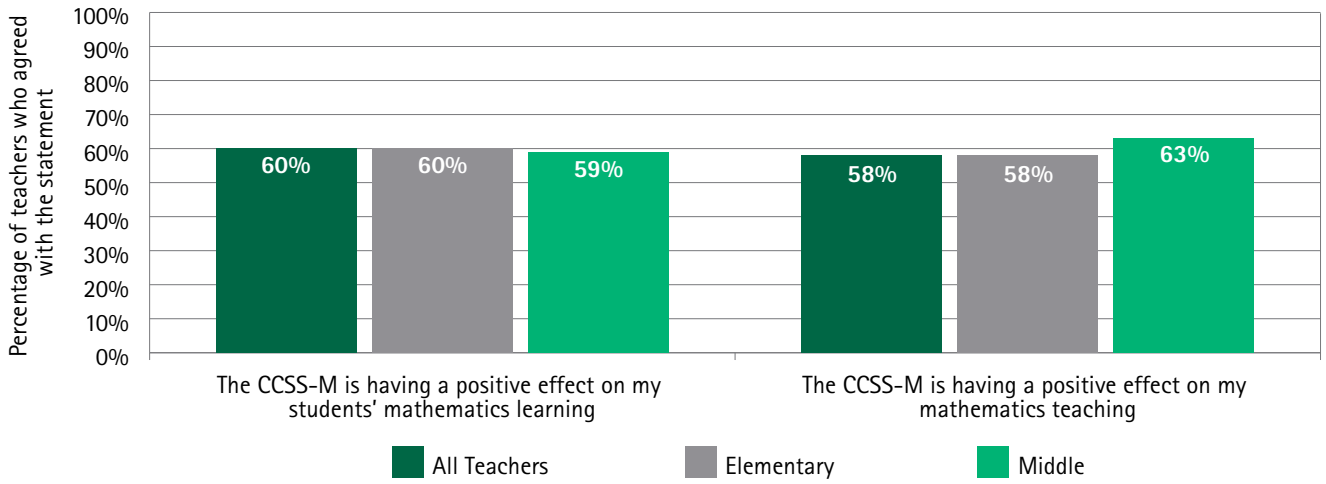
Effect of CCSS-M on teaching and learning

Teachers' knowledge and beliefs about their students, work contexts, and professional competencies greatly influence education policy implementation and classroom mathematics instruction (Ball, Thames, & Phelps, 2008; Bandura, 1982; Fang, 1996; Little, 1993; Peterson, Fennema, Carpenter, & Loef, 1989; Putnam & Borko, 2000; Richardson, 1996). Unlike just a few short years ago when CCSS-M was still an idea in the making, in spring 2015 the majority of MiC teacher survey respondents believed that CCSS-M is having a positive influence on mathematics teaching and learning. On average, more than half of the teachers agreed with two statements about the effect of CCSS-M on teaching and learning:

- "*The CCSS-M is having a positive effect on my students' mathematics learning*" (60% agreed).[2]
- "*The CCSS-M is having a positive effect on my mathematics teaching*" (58% agreed; see Figure 1).

Middle school teachers were slightly more likely than elementary school teachers (63% compared to 58%) to agree with the statement that CCSS-M is having a positive effect on their mathematics teaching.

Figure 1. Teacher Perceptions about the Effect of CCSS-M on Teaching and Learning



2 References to five-point Likert-scale items with separate rating options for "agree" and "strongly agree" will be combined as a positive rating ("agree"); similarly, separate rating options for "strongly disagree" and "disagree" will be combined as a negative rating ("disagree").

Lens into District Practice: Observing the CCSS-M in Practice

MiC districts are collecting data on the extent to which teachers are incorporating the Standards for Mathematical Practice (SMP) and CCSS-M content into their classroom practice. One district revised a classroom walk-through tool previously used to observe English language arts classrooms to develop four "understandings" that reflect CCSS-M implementation: (1) high-quality instruction, (2) student "productive struggle" and persistence, (3) effective collaborative conversations, and (4) formative assessment. A second district chose the SMP, mathematical rigor, and several instructional practices as the focus of CCSS-M implementation for the 2014–15 school year.

While both districts have developed protocols to support data-gathering during classroom walk-throughs on the extent to which these practices are being used in classroom mathematics instruction, the observation procedures and purpose differ. In the first district, district-level mathematics coaches and school-site representatives collected the data with the intention of providing action-oriented feedback for schools. In the second district, district-level mathematics leaders collected classroom observation data during the 2014-15 school year to primarily support calibration of their observations and ensure that their data were reliable and useful for subsequent action planning. Reviewing the data gathered from classroom walk-throughs led both districts to revise their classroom observation protocols to encourage observers to gather more evidence on how instruction specifically demonstrates (or does not demonstrate) the particular understandings and practices related to the CCSS-M on which the district is focusing.

Mathematics content knowledge and pedagogy to support CCSS-M implementation

Teachers' feelings about mathematics and about their own subject matter knowledge are also important indicators of reform outcomes. In general, teachers frequently report confidence in their mathematics knowledge, but teachers' over-confidence in their mathematics knowledge can negatively affect their learning stance and subsequent ability to support students' mathematics achievement (Cohen & Ball, 1990; Malzahn, 2002; Stipek, Givvin, Salmon, & MacGyvers, 2001). In particular, elementary teachers responsible for teaching all academic content areas and who often have not been trained as deeply in mathematics as upper grade teachers may still feel relatively well qualified to teach mathematics (Malzahn, 2002).

In the survey, the majority of MiC teachers (80%) reported confidence in their knowledge of the mathematics needed to teach CCSS-M; middle school teachers were more likely than elementary teachers to feel they have adequate mathematics content knowledge (90% compared to 78%). Administrators also reported that they have adequate mathematics content knowledge (75%) and mathematics pedagogical knowledge (66%) to support CCSS-M implementation (see Figure 2). While teachers reported confidence in their mathematic content knowledge, several teachers also commented specifically on the mathematics they were learning by implementing the CCSS-M. For example, teachers' comments included the following:

- "With CCSS… I am learning new ways of how to solve math problems."
- "I am more aware of the sequential development of learning math concepts."
- "I believe the new CCSS have help[ed] me clarify and break down bigger concepts in math."

Preparation and confidence in implementing the CCSS-M

Compared to what they reported about their mathematics content knowledge, teachers reported less confidence about their overall preparation to support their students in achieving mastery of the CCSS-M. While 51% of teachers agreed that they felt well prepared, a quarter of the teachers disagreed. Teachers reported that incorporating two aspects of the CCSS-M into their mathematics lessons and units was particularly challenging. As shown in Figure 3, on average teachers were more likely to feel confident that their lessons and units "*support students' use of the Standards for Mathematical Practice*" (64%) than they were to feel confident that their "*lessons and units reflect the primary mathematical concepts, depth of knowledge, and foundational knowledge prioritized in the CCSS-M for my grade level*" (58%). (See the Lens into District Practice: Observing the CCSS-M in Practice text box for ways that two districts

Figure 2. Teachers' and Site Administrators' Perceptions about Their Mathematics Content Knowledge for CCSS-M

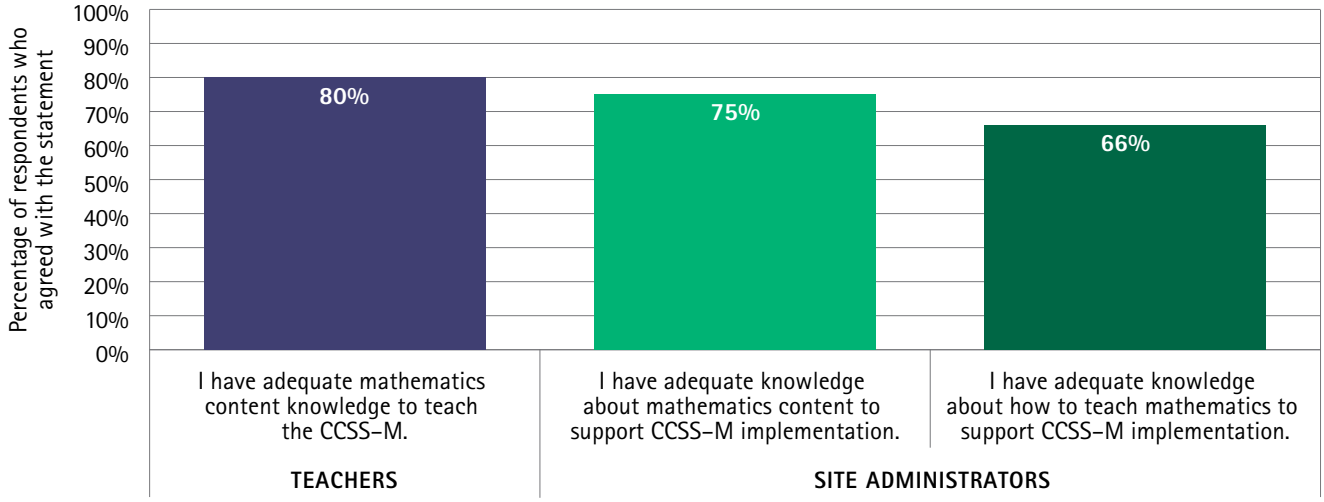
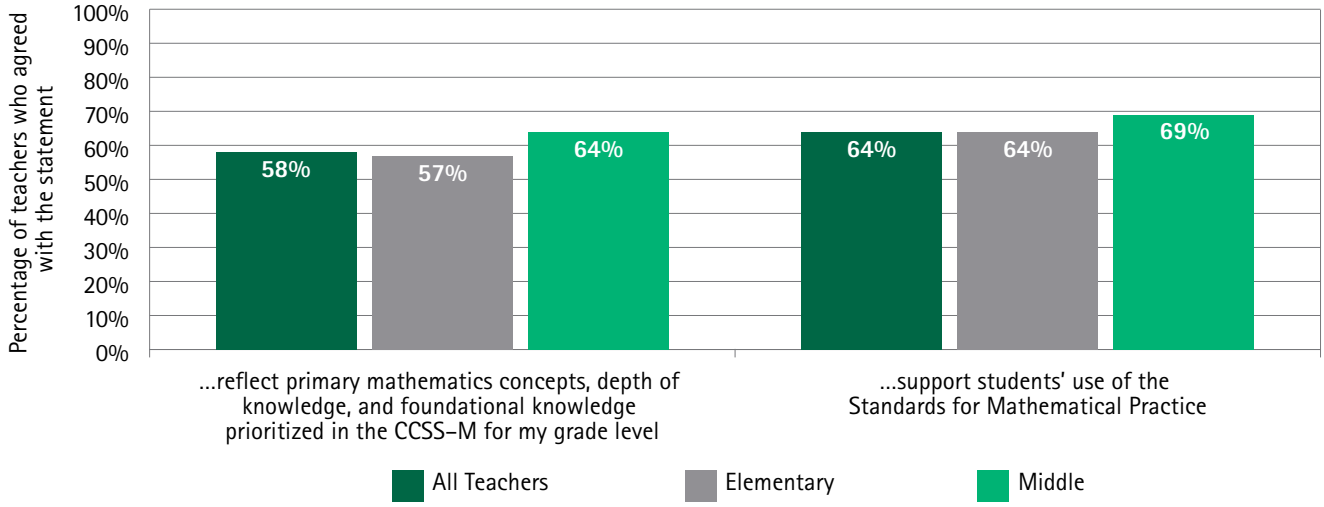


Figure 3. Teachers' Confidence that Their Lessons and Units…



Support for the Math in Common Community of Practice: Principal Institutes

California Education Partners has organized a series of principal leadership institutes to support MiC site leaders in using shared strategies to help build more coherent CCSS-M implementation plans, specifically connected to each district's prioritized vision and outcomes. During the summer of 2015, Dr. Timothy Kanold will return for a second series of institutes for MiC districts in Northern and Southern California. The institutes will focus on supporting groups of 30-50 principals from each district to learn how to monitor for "things that really matter in your school," become confident in the nature of the monitoring tools being used, provide feedback on findings from the monitoring, and create a school culture that embraces mistakes and learning. During the institutes, principals will reflect on, examine, and better understand the quality of the mathematics teaching and learning efforts in their school and work with district mathematics leaders on their plans for 2015–16.

are supporting their staff to better understand the Standards for Mathematical Practice through observation and discussion.) Middle school teachers were slightly more likely than elementary school teachers to agree that they were confident that their lessons and units reflect CCSS-M.

Principal preparation and instructional leadership in support of the CCSS-M

Principal leadership follows closely behind classroom teaching as the second most important factor influencing student achievement (Wallace Foundation, 2013). To effectively support CCSS-M, site administrators will need to develop new knowledge and capacity about curriculum, instruction, and assessment in order to adequately monitor instructional shifts and student learning and to understand and support future learning needs for staff and students. Supporting effective CCSS-M implementation is a major effort, and earlier reporting on principal leadership related to CCSS-M suggests that principals have been overlooked and underprepared in guiding teachers in CCSS-M implementation (Gewertz, 2012). Involving and preparing site administrators to be leaders in both school change and instruction in support of the CCSS-M will require new forms of learning and support from the MiC districts.

In contrast to the 2012 Gewertz report about administrator preparation, in this spring 2015 survey, more than half of MiC site administrators (64%) reported feeling well prepared to be an instructional leader in support of CCSS-M (see Figure 4). Responding administrators felt least prepared when it came to the classroom implementation of CCSS-M, specifically regarding "*providing effective instructional models for teachers to support CCSS-M implementation in the classroom*," and "*accessing practical how-to guidance to support changes in instruction*" (see Appendix B for these data and additional survey data on site administrator preparation for implementing the CCSS-M).

Teachers were less positive about their site administrators' preparation as instructional leaders. On a question asking teachers about their administrators' preparation, fewer than half (48%) agreed with the statement "*My site administrators are well prepared to be instructional leaders in support of the CCSS-M*" (see Figure 4). Other data suggest that there may be some truth in teachers' ratings of their administrators' preparation: more than half of site administrators reported spending no time participating in professional learning activities that could support or develop their mathematics instructional leadership (e.g., scoring student performance assessments, creating/selecting curriculum guidelines, creating/selecting curriculum or assessment materials). See the Support for the Math in Common Community of Practice: Principal Institutes text box for details about institutes that the MiC districts are participating in to support principals' instructional leadership.

Lens into District Practice: Principal Leadership

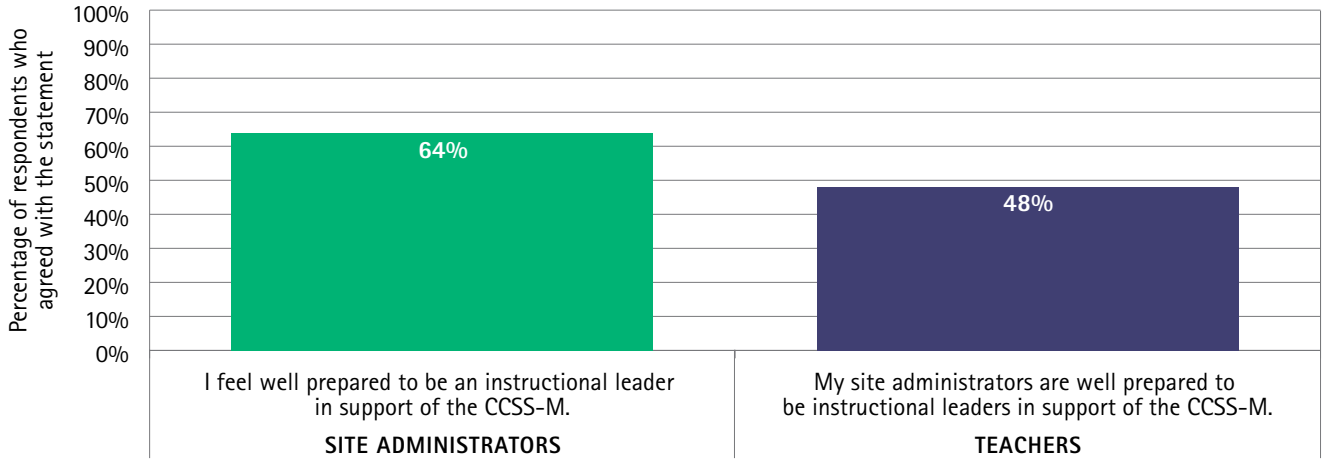
Districts are gathering data to determine both the effectiveness of site administrator preparation and areas of needed support in relation to leading CCSS-M implementation efforts. For example, one district is measuring the extent to which site administrators have been successful at aligning the district vision of CCSS implementation with CCSS implementation at the school-site level and the extent to which site administrators are reflecting on this alignment. To measure these things, district leaders have gathered narrative data from teacher training feedback forms and from discussions at principal meetings and administrator professional learning communities (PLCs).

A second district is interested in helping site administrators strengthen site-level PLCs by increasing attendance. To measure progress toward this goal, district leaders collected PLC attendance data for each site and shared the results with each site administrator. This allowed district leaders to see which PLCs had lower or intermittent attendance and needed additional support, and provided information for follow-up meetings with site leaders to discuss strategies for increasing attendance.

PROFESSIONAL DEVELOPMENT TO SUPPORT CCSS-M IMPLEMENTATION

Curriculum, assessment, and teacher professional development have been described as three critically important pillars of effective systemic reform (Smith & O'Day, 1990). In the current context of CCSS-M, because summative student assessment available through the PARCC and Smarter-Balanced national consortia has lagged and the alignment of existing curricular materials to CCSS-M has been questionable (Heitin, 2015), districts have led with an emphasis on professional development. Large majorities of U.S. teachers do not believe that professional development is helping them prepare for the changing nature of their jobs, including implementing CCSS-M (Boston Consulting Group, 2014). In our survey, the 49% of MiC teachers who did not feel prepared to support their students to achieve CCSS-M was consistent with this broader finding. As such, we were curious how teachers in MiC districts viewed the professional development opportunities they received in the past 12 months related to supporting CCSS-M implementation.

Figure 4. Perceptions about Administrator Preparation for Instructional Leadership in Support of the CCSS-M



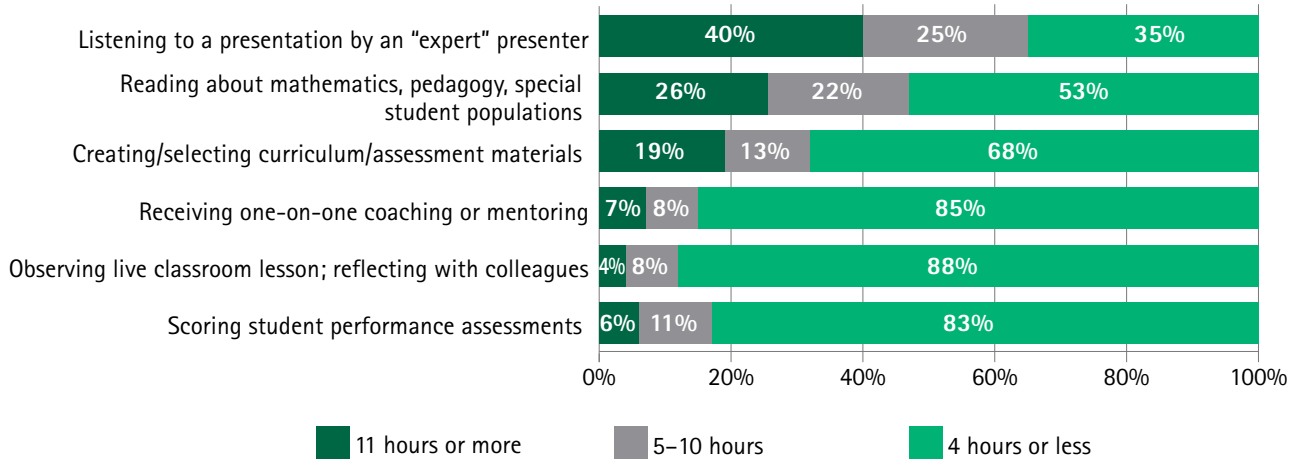
Types of professional learning activities

We expected that district leaders would organize various types of professional learning opportunities to support their teachers' development and classroom instruction related to CCSS-M implementation. When asked to indicate which of six types of professional learning activities they participated in during the past 12 months and how much total time they spent in each, the largest percentage of teachers reported spending most (11 hours or more) of their professional learning time listening to a presentation by an expert (40%; see Figure 5). The next most frequent activity was reading about mathematics, pedagogy, and special student populations, although half of the teachers (53%) reported spending four hours or less doing so. More than 80% of teachers reported spending a minimal amount of time (4 hours or less) in three types of professional learning activities: *Observing live classroom lessons and reflecting afterwards with colleagues*; *Receiving one-on-one coaching or mentoring related to the CCSS-M*; and *Scoring student performance assessments.* More than two-thirds (68%) of teachers also reported spending four hours or less *"participating in district-led efforts to create or select curriculum guidelines, curriculum, or assessment materials for CCSS-M implementation"* (see Figure 5).

Teachers in general describe ideal professional learning opportunities as ones that are relevant to their context and interactive, allowing them hands-on participation (Boston Consulting Group, 2014). Similarly, professional development that focuses on academic subject matter, gives teachers opportunities for active learning, and is integrated into the daily life of the school is more likely to produce enhanced knowledge and skills (Garet, Porter, Desimone, Birmin, & Yoon, 2001). It could be argued that the activities that MiC teachers spent the least amount of time on are the most interactive and relevant to teaching practice. While it is only one voice out of a large group, the words of one teacher respondent reflect some concern about the professional development opportunities that are available to teachers to help them implement the CCSS-M:

> **"Teachers often feel as though professional development is something done to them, instead of something done for them, involving them as active partners in their own professional growth" (Leinwand, Brahier, & Huinker, 2014, p. 101).**

Figure 5. Percentage of Teacher Participation in Professional Learning Activities Over the Last 12 Months



Note: In some cases percentages do not sum to 100 due to rounding.

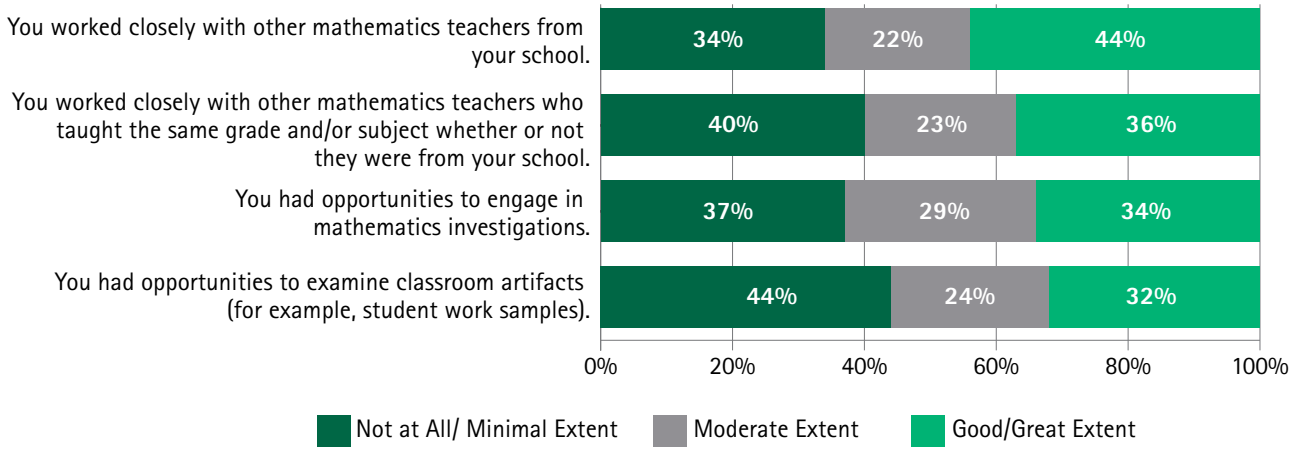
Teachers must have access to quality professional development to further and deepen our own conceptual understanding of mathematics. Most teachers I collaborate with learned math procedurally—similar to the old standards. However, now we are being asked to teach math conceptually (and some procedural too), and being expected to have a deep understanding without the training, support, and time needed. This is a formula for failure!

While the survey findings outlined in Figure 5 suggest that MiC professional learning activities are mostly district-provided professional development, results from another survey question suggest that the professional learning offered to teachers may be more nuanced and rich than just showing up for uni-directional sessions with expert presenters. Figure 6 shows that when teachers were asked to think about their mathematics-related professional learning and the extent to which certain statements described their experience, about half (44%) of the teachers indicated substantial opportunity to work closely with other mathematics teachers from their school, while 34% of teachers had little or no opportunity to do so. About a third (36%) of teachers reported having substantial opportunity to work closely with teachers in the same grade level and/or subject, whether or not they were from the same school; a larger percentage of teachers (40%) reported having little or no opportunity to do so. The same is true of teachers' opportunities to engage in mathematics investigations—34% reported having substantial opportunity, while 37% reported having little or no opportunity. In addition, 44% of teachers reported little or no opportunity to examine classroom artifacts. These data illustrate district (and/or school-level) differences in the active learning opportunities teachers are provided during their professional learning. (See the Lens into District Practice: Lesson Study text box for information on how some MiC districts are incorporating lesson study as a more active form of professional development.)

Support provided by professional learning opportunities

Supporting students in achieving mastery of the CCSS-M will require instruction that is beyond business as usual, including placing a greater emphasis on student construction of mathematical ideas, conceptual understanding alongside procedural knowledge, and the use of rich mathematical tasks that allow opportunities for students to discuss and explain mathematical reasoning (Common Core State Standards Initiative, 2011; Hiebert & Grouws, 2007; Stein, Grover, & Henningsen, 1996).

Figure 6. Extent of Teachers' Active Learning Opportunities During Professional Development



Note: In some cases percentages do not sum to 100 due to rounding.

Lens into District Practice: Lesson Study

Based on the increasing popularity and research-based benefits of classroom-focused professional development, several MiC districts are using lesson study or modified versions of lesson study for professional development. Lesson study is collaborative, practice-based professional learning in which teachers study the academic content of the curriculum and plan, enact, observe, and analyze a live classroom lesson (Lewis, Perry, & Hurd, 2009). Lesson study can support collaborative observation of student responses and learning, as well as observation of in-the-moment relationships between teacher instruction and student learning. In addition, the post-lesson debriefing can help teachers build on what they observe to inform next steps for their own instruction.

Beginners to lesson study frequently grasp a few superficial features of the process, such as teaching a lesson multiple times to "perfect" it or lesson planning without subsequent reflection on implications for broader learning and application to support ongoing instructional improvement (Perry & Lewis, 2009). For lesson study to be worthwhile, districts need to have a clear picture of what lesson study is and what goals they would like to accomplish through the process (Lewis & Hurd, 2011).

One MiC district's modified approach to lesson study involves a school grade-level team—in collaboration with a consulting district mathematics coach—planning, collaboratively observing, and debriefing on a series of three lessons with grade-level teammates. The intention is to provide coach-supported joint planning time for grade-level team members on curriculum, with specific supports for lesson structure, questioning strategies, student engagement techniques, and classroom management. The intention is also to support teachers' use of shared tools specific to the implementation of the Standards for Mathematical Practice, and to provide teachers with an opportunity for collegial feedback and support. Schools are provided substitute release time for team members to participate in the activities.

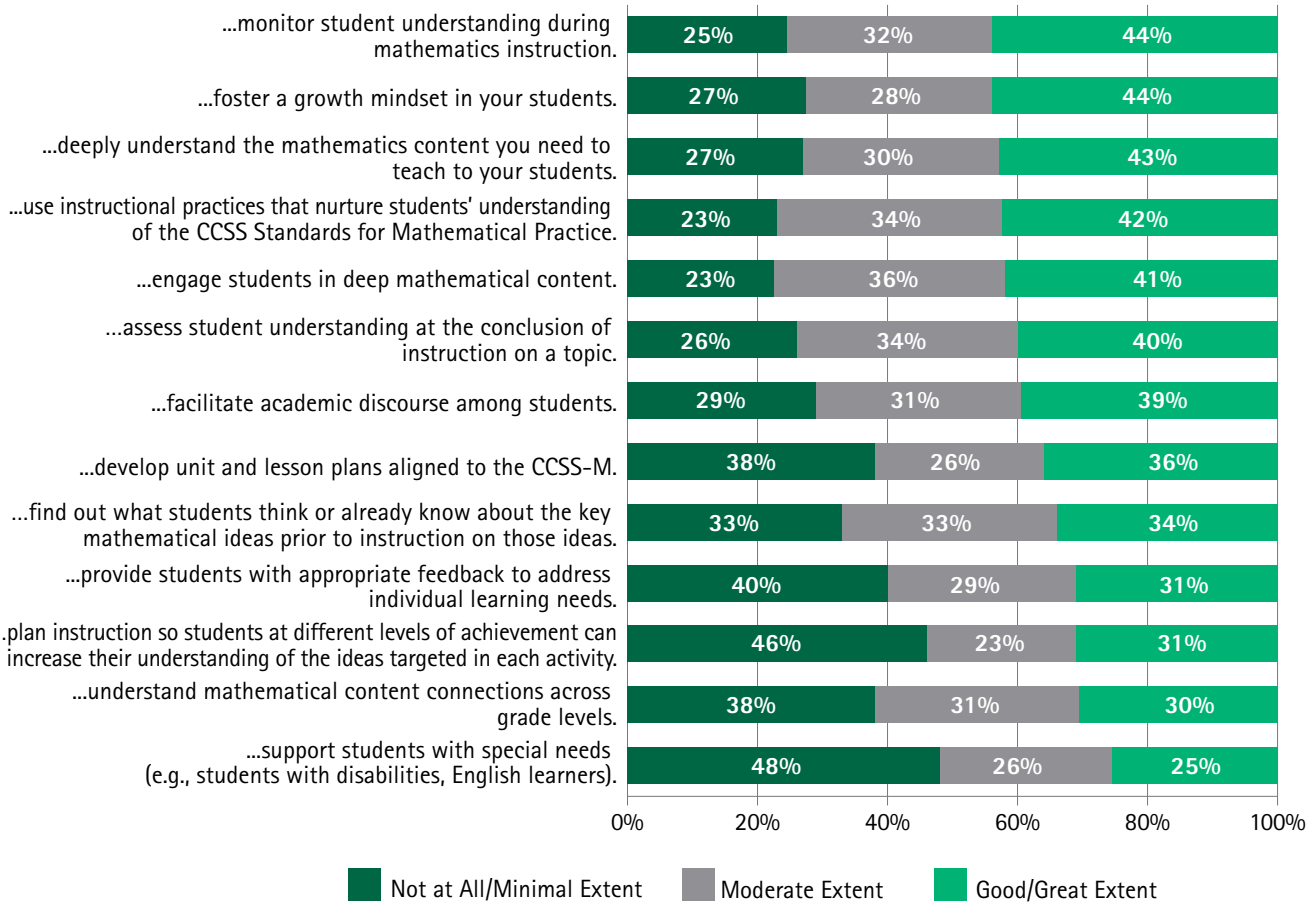
To assess the extent to which the MiC districts had organized supports for various aspects of instruction to support them in navigating the instructional shifts necessary for implementing the CCSS-M, we asked teachers to rate the extent to which "*professional learning activities during the past 12 months provided you with the support needed…*" to engage in various different kinds of instructional activities. Specifically, we gave them a list of 13 categories of instructional activities (some drawn from previous surveys and some created by our research team) and asked them to rate how much support they received in each category through professional learning. The areas that teachers reported receiving the most support were *monitoring student understanding during mathematics instruction* and *fostering a growth mindset in students*.

Formative assessment, which involves monitoring student understanding during mathematics instruction, has been identified as one of the most powerful instructional learning practices for improving student learning (Black & Wiliam, 1998; Datnow, Park, & Wohlstetter, 2007; Ebby & Sirinides, 2015; Heritage, Kim, Vendlinski, & Herman, 2009; Kerr, Marsh, Ikemoto, Darikek, & Barney, 2006; Young, 2006). Ebby and Sirinides (2015) describe formative assessment as "a process whereby an assessment provides feedback to both the learner and the teacher and this feedback causes an adjustment in instruction….Effective formative assessment…requires that the teachers are able to understand and analyze students' thinking to develop an instructional response that will move the learner forward" (p. 159). Teachers' responses to our survey indicating that they received support for monitoring student understanding is encouraging; their responses may reflect learning opportunities provided in these MiC districts to support teachers' use and improvement of formative assessment practices. (For example, California Education Partners has organized workshops for the Math in Common districts with Dylan Wiliam, an expert in the field of formative assessment.) See the Lens into District Practice: Formative Assessment text box for one example of how one MiC district is focusing on formative assessment.

Two areas of instructional activities that teachers reported feeling least supported in through their professional learning were related to supporting all students to be successful. When asked how much their professional learning activities supported them to "*... support students with special needs (e.g., students with disabilities, English learners)*" and "*...plan instruction so students at different levels of achievement can increase their understanding of the ideas targeted in each activity,*" almost half of the responding teachers indicated that they received little or no support from professional development in these two areas (48% and 46%, respectively). One teacher commented, "As of now—March 2015—there has not been any training provided to special education teachers."

Figure 7 also shows that other areas in which teachers reported receiving little professional development support were "*providing students with appropriate feedback to address individual learning needs*" (40% of teachers reported having little or no support in this area) and "*understanding mathematical content connections across grade levels*" (38% of teachers reported having little or no support in this area). This latter point is noteworthy because it will be important for teachers to understand mathematical connections across grade levels in order to fully grasp the coherence of the CCSS-M. In addition, 38% of teachers felt little or no support to "*develop unit and lesson plans aligned to the CCSS-M,*" a finding that validates the earlier reported result about teachers' lower confidence that their lesson plans reflect CCSS-M content and Standards for Mathematical Practice.

Figure 7. Extent of Professional Learning Support for Teachers to...



Note: In some cases percentages do not sum to 100 due to rounding.

Lens into District Practice: Formative Assessment

Several districts are focused on understanding the extent to which teachers are using formative assessment practices in their instruction to monitor students' understandings and skills relative to the CCSS-M. One district has organized job-embedded professional development days—focused on formative assessment activities—across middle schools as a professional learning model similar to lesson study.

Essentially, the embedded day process is built around two iterations of a formative process. In contrast to off-site professional development, these professional development days start with several teachers (including visiting teachers and the classroom teacher) collaboratively observing students working on mathematics during a classroom lesson. After the observation, teachers work together to analyze student work, define a set of objectives and success criteria based on their analysis of the student work, and then design the first iteration of a task to meet the criteria. Teachers then use the task with students and observe how the students interact with the task. After the observation, teachers revise the task and present it again to a new group of students. This process happens during the course of one school day.

One purpose of this work is to build a shared understanding of formative assessment techniques relative to the Standards for Mathematical Practice across sites and grade levels. Additionally, this district has collected data about the extent to which teacher training sessions focused on formative assessment, the support offered to teachers on formative assessment, and teacher self-assessments regarding their use of formative assessment.

TEACHER TRAINING AND SUPPORT FOR SPECIAL STUDENT POPULATIONS

Teachers of special populations of students—including English learners, special education students, and students who struggle academically in other ways—may need to make additional adaptations to their instruction in order to support all students to master the CCSS-M and become college- and career-ready. For example, Judit Moschkovich (2012) describes four principles of effective mathematics instruction for English learners that might be used to help support them in achieving mastery of the CCSS-M: (1) focus on students' mathematical reasoning, not accuracy in using language; (2) focus on mathematical practices, not language as single words or definitions; (3) recognize the complexity of language in mathematics classrooms and support students in engaging in this complexity; and (4) treat everyday home languages as resources, not as obstacles. Similar principles to accelerate and provide access to the CCSS-M–aligned curriculum will need to be considered for other groups of students.

Teacher training to support special student populations

To find out more about how MiC districts were addressing these issues, our survey asked teachers, site administrators, and district administrators for their perceptions of how well teachers in their schools/districts have been trained to support special student populations. When asked to rate the extent to which teachers at their school were trained to ensure that English learners have access to CCSS-M, less than half of the teachers that we surveyed (48%) agreed. On average, teachers in districts with larger proportions of English learner students rated their school's teachers higher on this question. The Lens into District Practice: Supporting Students' Academic Discourse text box provides some brief information on actions one district is taking to support CCSS-M for English learners. Despite some promising

strategies like those described in the text box, in their open-ended comments, several teachers registered concern for their English learner students, including one teacher who wrote:

> *I am in a school with 100% [of our students eligible for] free and reduced-price lunch, and with a very large population of English language learners and 100% academic English language learners. My students are failing. Kids who once loved math now find it stressful because it is so language dependent and language is a point of struggle. We do not have support for ways to integrate these theories into a fifth grade classroom in which students have never experienced this type of math instruction and who struggle greatly with the language barrier.*

Site administrators responded similarly to teachers on two survey items about their perceptions of their school's teacher training to support special populations of students in having access to the CCSS-M. Less than half of site administrators agreed with the statements "*Teachers at my school are trained to ensure that English learners have access to the CCSS-M*" (49%) and "*Teachers at my school are trained to ensure that students with disabilities have access to the CCSS-M*" (46%) (see Figures 8 and 9, respectively).

We asked slightly different questions of district administrators about special student populations, emphasizing teacher knowledge and expertise to ensure equitable access to the CCSS-M. District administrators had more mixed opinions regarding teacher training to ensure that English learners could master CCSS-M as well as their English proficient students (see Figure 8). District administrators seemed more concerned about teachers' training and knowledge to ensure access for special needs students, with more than a third disagreeing that "*teachers in this district are trained to ensure that students with disabilities have access to the CCSS-M*" (43%) and that "*Our district provides teachers the knowledge and expertise they need to ensure that their students with special needs can master the CCSS-M as well as typical students*" (39%; see Figure 9).

Lens into District Practice: Supporting Students' Academic Discourse

Academic conversations are thought to support student learning by building five central skills useful in particular content areas: elaborating and clarifying; supporting ideas with examples; building on and/or challenging a partner's ideas; paraphrasing; and synthesizing conversation points (Zwiers & Crawford, 2011). These skills overlap with the Standards for Mathematical Practice, such as Standard #3: "Construct viable arguments and critique the reasoning of others."

One MiC district has identified the amount of time students engage with each other through academic mathematics conversations as a key area for enhancing the delivery of CCSS-M instruction, especially to meet the needs of English learners. District leaders have developed an observation protocol tool that focuses on the level of academic discourse present in the classroom; the observation protocol is designed to be used in collaborative school-site groups. District leaders gather data on the number of site-level trainings organized for at least one grade level or department, and on the findings reported by school sites after teachers collaboratively use the tool. This information supports district leaders in understanding the extent to which district-provided professional development regarding student-to-student engagement has been translated into classroom instruction. Initial data enabled district leaders to learn that in the majority of observed classrooms, students were engaged in beginning-level academic conversations. These data provided important information to inform the district professional development efforts. The process of collecting the data has also surfaced the need for district leaders to calibrate the meaning of "academic discourse" and get specific about the evidence or lack of evidence used to justify a proficiency-level rating.

Figure 8. Perceptions of Teacher Training to Support English Learners

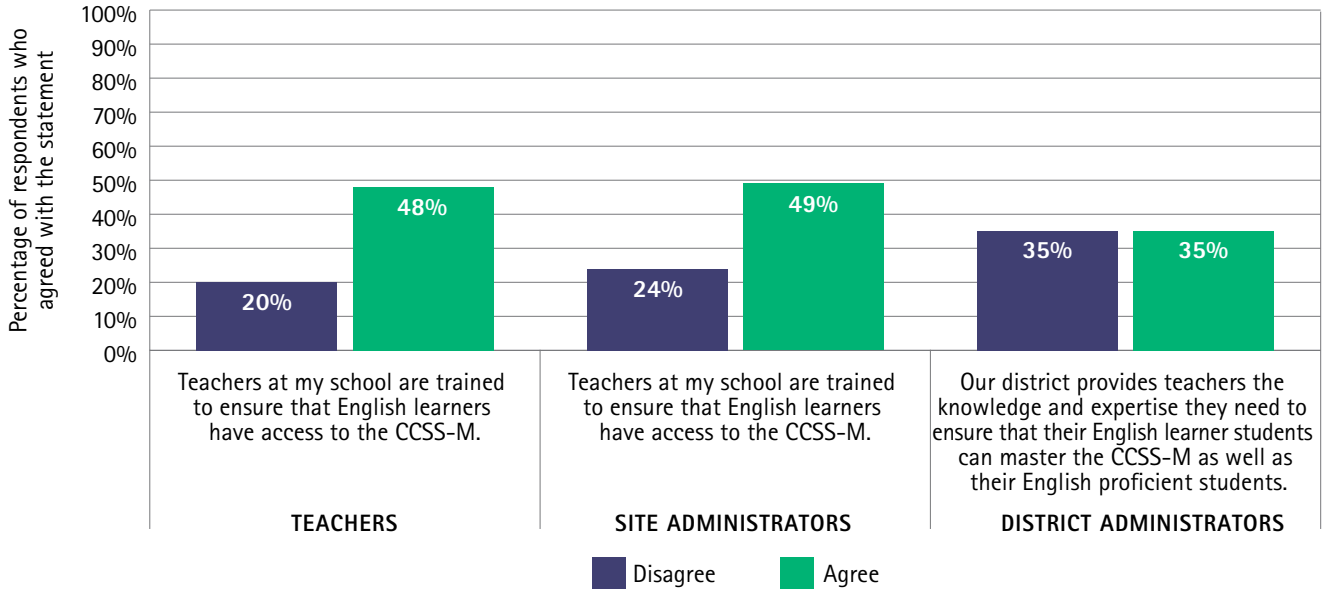
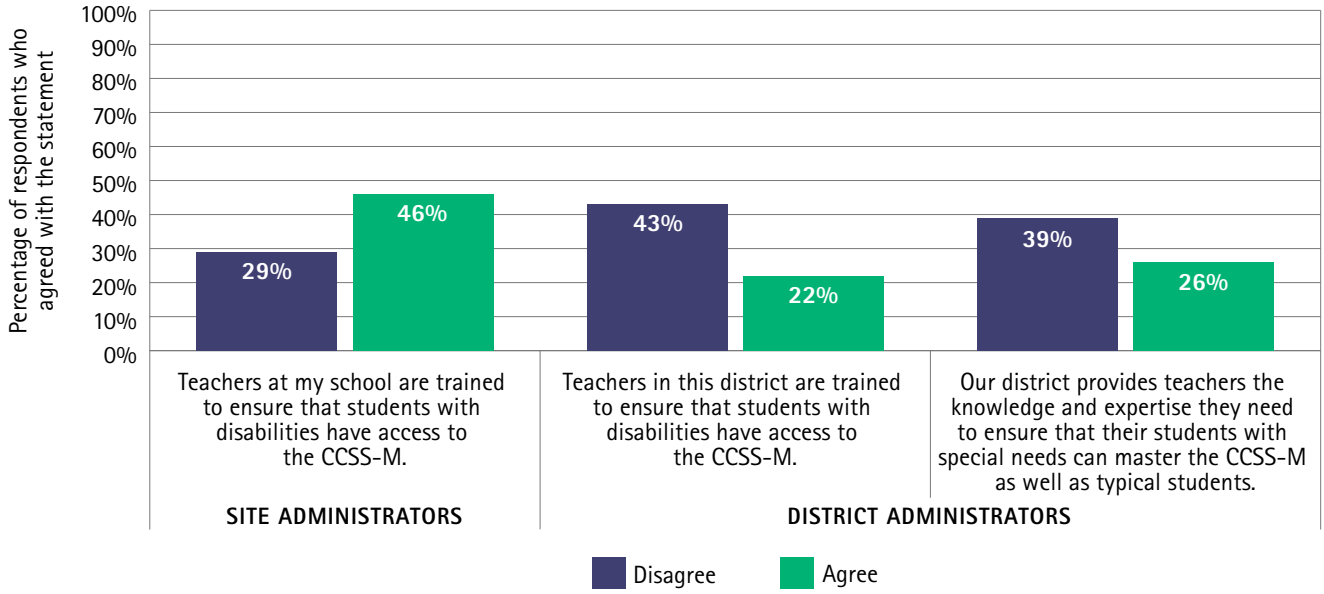


Figure 9. Perceptions of Teacher Training to Support Students with Disabilities and Special Needs Students



Note: Teachers were not asked about the extent of their own training to ensure access for students with disabilities; rather, teachers were asked to report on the extent to which the school's curriculum materials ensured access for students with disabilities. Multiple questions, drawn from surveys using somewhat different language to refer to populations of students, were asked of district administrators.

INSTRUCTIONAL MATERIALS TO SUPPORT COMMON CORE STANDARDS IMPLEMENTATION

Teachers and site administrators were asked to report on the instructional materials students used most often, and about half of each group responded that students use a single commercially published textbook or program (see Figure 10). A slightly higher percentage of teachers than site administrators noted the use of non-commercially published materials (25% compared to 18%). District-level differences were evident for this question; the majority of teachers in two MiC districts indicated that they used non-commercially published instructional materials most often.

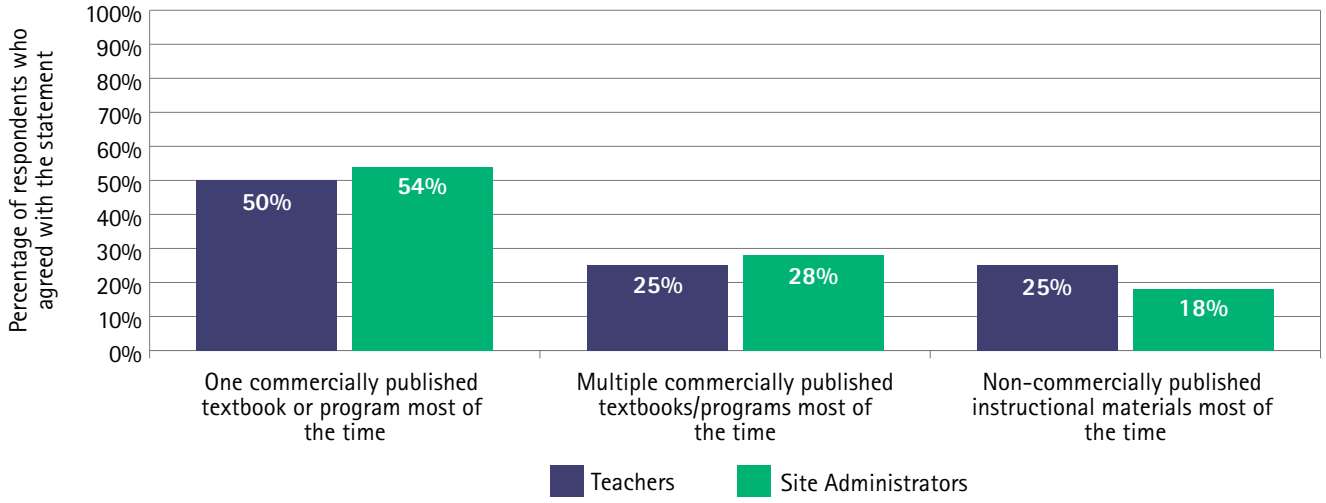
Availability of resources to align instruction to the CCSS-M

When teachers and site administrators were asked to comment on whether teachers had the resources needed to align their mathematics instruction with CCSS-M, significantly fewer teachers than site administrators agreed (50% and 72%, respectively) that the district provided them with the resources they needed to align instruction with CCSS-M (see Figure 11). Additionally, at the school-site level, only 49% of teachers agreed that their schools provided them with the resources they needed to implement CCSS-M.

In their open-ended comments, many teachers indicated that at present they are required to gather their own standards-aligned materials, resulting in a lack of consistency and clarity. For example, one teacher commented, "I am spending lots of personal time developing curriculum. I'm not a curriculum specialist nor writer. We're all pulling stuff off the Internet. We are thrown in different directions." Another teacher commented, "…I STILL have not received ANY math curriculum or materials for my students. I am told the district is completely out of third grade materials. I keep asking and they keep telling me they are out of stock, they are reordering, etc. I feel very isolated trying to implement this shift completely on my own and using my own materials and readings to try and train myself. No one seems to care about my students mathematically speaking."

While the survey results suggest the need for curriculum revisions, evidence from our ongoing interactions with the MiC districts since the 2015 survey administration show how much of a moving target CCSS-M implementation can be; MiC districts have already made progress in this area. For example, three districts adopted new curriculum during the 2014-15 school year, but will not begin to use the curriculum until the 2015-16 school

Figure 10. Teacher and Administrator Perceptions of Curriculum Materials Used Most Often by Students



year. Survey responses from teachers in these districts may have reflected dissatisfaction with access to CCSS-M materials that has already been addressed by district implementation efforts.

Scope and sequence of mathematics curriculum

While teachers were not overwhelmingly positive about the resources provided for them to align their instruction with the CCSS-M, most teachers felt they have a solid understanding of the scope and sequence for the school's mathematics curriculum (see Figure 12). When asked about their understanding of the scope and sequence for their grade level, 69% of teachers agreed that they had a solid understanding, while 57% of site administrators agreed they had a solid understanding of the scope and sequence for their school's mathematics curriculum. This lower percentage of site administrators' self-ratings of scope and sequence understanding may reflect the fact that the question focused on the curriculum for the school, which requires broader

Figure 11. Perceptions on Availability of Resources Teachers Need to Align Instruction with CCSS-M

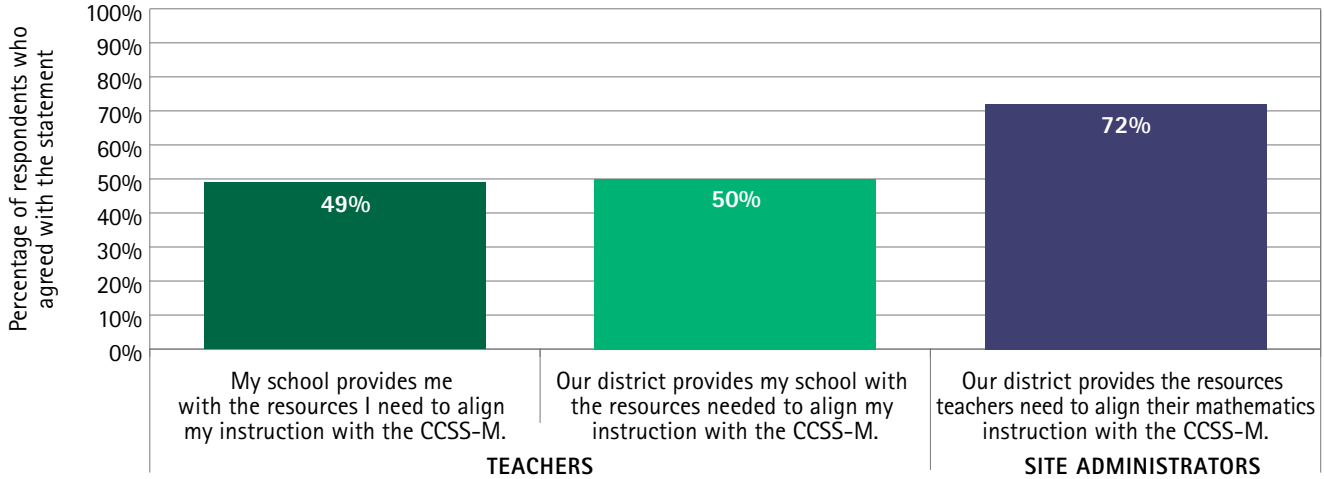
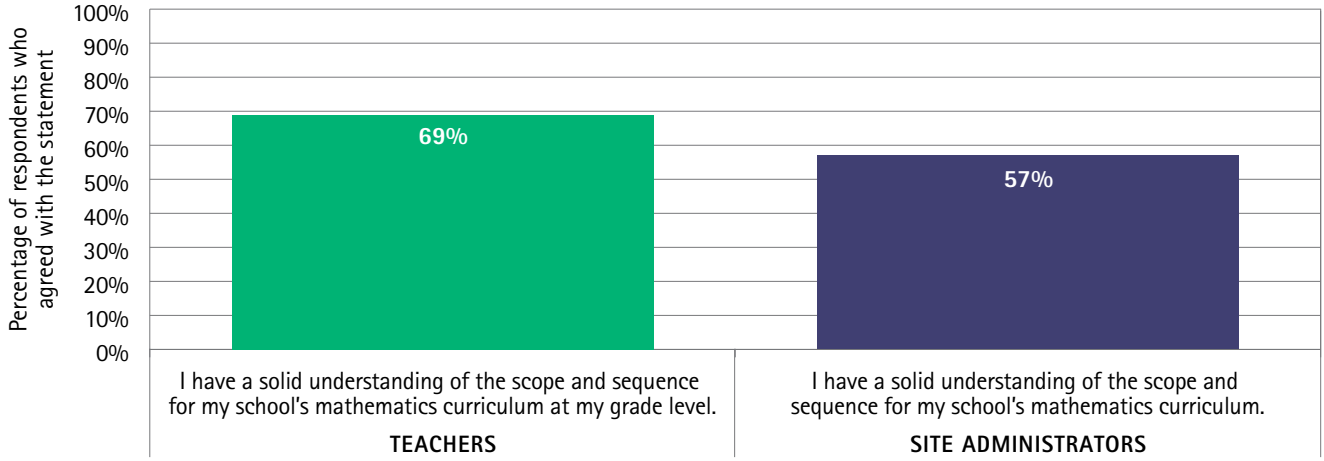


Figure 12. Teachers' and Site Administrators' Understanding of the Scope and Sequence of the Mathematics Curriculum



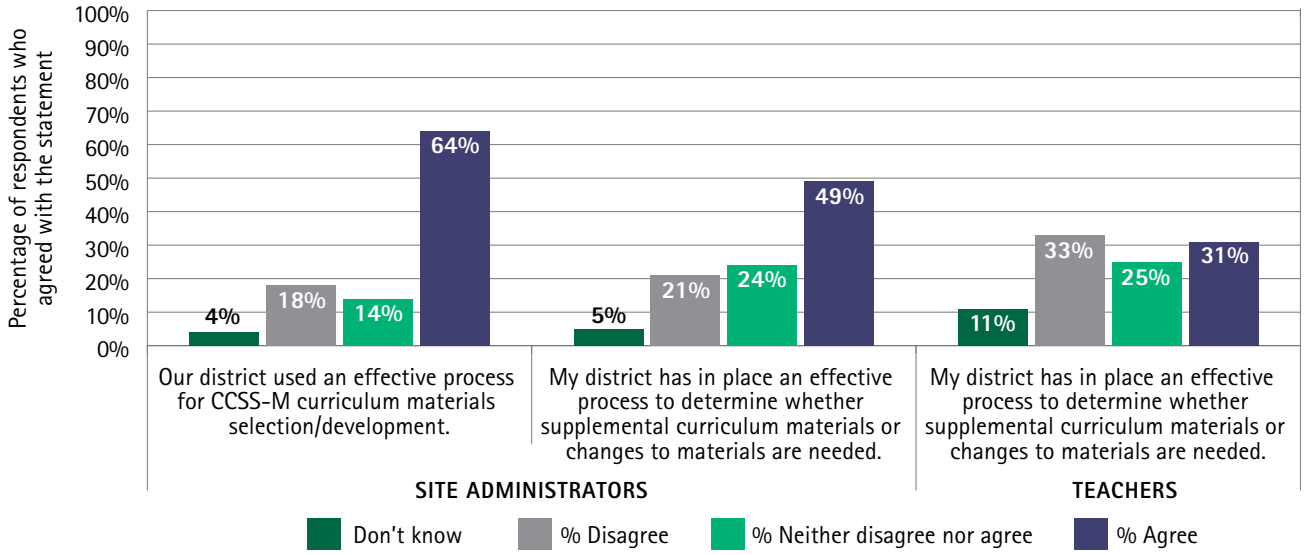
understanding than for a single grade level as was asked of teachers. Nevertheless, the relatively lower percentage of administrator agreement with the statement suggests that scope and sequence of the curriculum could be one area of useful focus for site administrator professional development in the MiC districts.

CCSS-M curriculum materials

For curriculum to positively impact classroom instruction and student achievement, the curriculum materials must be in place and teachers must feel that the resources they are provided are sufficient to support the envisioned instruction. We expected that because of the paucity of CCSS-M–aligned curriculum materials prior to the 2014–15 school year, MiC districts would build in a process for assessing the adequacy of their materials over time and for supplementing or changing them as needed. A survey item that asked site administrators to rate the effectiveness of their district's process for selecting and/or developing CCSS-M curriculum materials showed that a majority of site administrators (64%) agreed that the selection/ development process was effective (see Figure 13). However, results show

"Implementers of new instructional materials would be wise to attend to the role of principals and teachers as co-constructors of the planned and implemented curriculum—either by selecting materials that are a good match for local staff, or else by working closely with staff to ensure buy-in and minds-on implementation.… Doing so might encourage productive adaptations that improve student learning, while failing to do so might encourage lethal mutations that retard student learning" (Kramer, Cai, & Merlino, 2015, p. 41).

Figure 13. Administrator and Teacher Perceptions of District Processes to Select/Change Curriculum Materials



Lens into District Practice: A Process for Curriculum Revision

In one MiC district, units of instruction aligned to CCSS-M were developed by over 100 district teachers. During the 2014–15 school year, printed, grade-appropriate units were distributed to all teachers and also made available electronically, and teachers districtwide began to use these units as the primary instructional resource to support their CCSS-M implementation. The units of instruction are built around four rich mathematics tasks (entry task, apprentice task, expert task, and milestone task), and professional development provided by the district mathematics department aims to help teacher leaders facilitate implementation of the units at their sites.

District leaders have set up processes for examining how teachers are using the curriculum (e.g., walk-throughs, data collection by teacher leaders) and are getting feedback directly from teachers. This feedback is intended to help district leaders understand the extent to which the curriculum is being used as intended, and may also provide information on whether and under what circumstances (e.g., lack of teacher mathematics teaching experience) teachers adapt the materials. This feedback is also being used this summer to support the design of summer professional development sessions and to make improvements to the curriculum units for use in the 2015–16 school year.

that administrators were more confident about the processes for selecting and developing CCSS-M curriculum materials than they were about the processes used to assess the need for changes or supplements to CCSS-M-aligned materials (see Figure 13). Teachers were not as confident (31% agreed) as principals (49% agreed) in the effectiveness of their district's process for assessing whether supplemental curriculum materials or changes to materials were needed. The Lens into District Practice: A Process for Curriculum Revision text box describes actions taken in one MiC district to support ongoing changes to curriculum to align it with the CCSS-M.

Curriculum materials that support special student populations

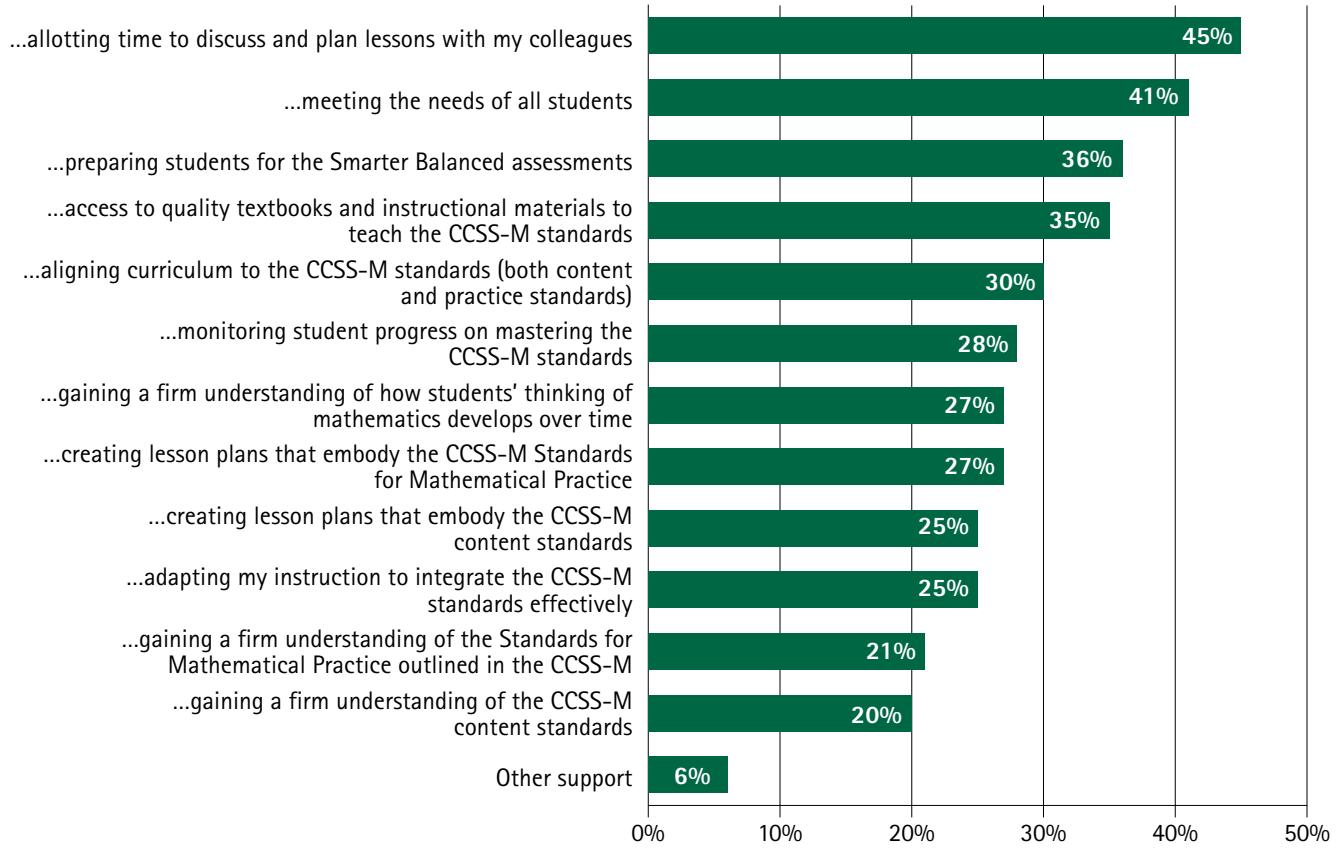
In addition to the lack of confidence regarding supplemental curriculum materials or changes to materials, teachers' responses also registered some concern about access in the curriculum for special student populations. Only 33% of teachers agreed that their school's "*curriculum materials ensure that students with disabilities have access to the CCSS-M.*" These data suggest that there may be a gap between teachers' knowledge and the materials available to them to support students with disabilities. One teacher's comment confirms this idea: "Especially in a special education classroom for students with moderate to severe disabilities there are not enough resources to implement all elements of the CCSS math standards."

TEACHER SUPPORTS FOR IMPLEMENTING THE CCSS-M

To gather information to support the MiC districts' ongoing CCSS implementation efforts, we asked teachers to respond to the survey item, "*To effectively implement the CCSS-M, I need support mostly in…*" Figure 14 shows that teachers reported needing support in *allotting time to discuss and plan lessons with their colleagues* (45%), followed closely by *meeting the needs of all students* (41%). Additionally, 36% reported needing support in *preparing students for the Smarter Balanced assessments* and 35% reported *needing access to quality textbooks and instructional materials to teach the CCSS-M*. The least frequent areas of reported need were related to *gaining a firm understanding of CCSS-M content* (20%) and *gaining a firm understanding of the Standards for Mathematical Practice* (21%), both of which may have been the focus

of teachers' professional learning experiences over this past year. While teachers may have received some support to gain a firmer understanding of CCSS-M, their perspectives on the extent to which this is a continued need may provide useful information for district leaders in charge of teacher professional learning experiences. That is, simply because teachers have received some support to better understand and implement the CCSS-M does not mean they may not need additional support in this area.

Figure 14. Percentage of Teachers Who Reported Needing Support in...



Interpreting the Survey Data: Implications for District and School-Site Planning

The primary purpose for conducting the survey in spring 2015 was to more fully understand the ongoing efforts surrounding CCSS-M implementation in the MiC districts. We wanted to know what we could learn, particularly from the teachers' perspective, about how the CCSS-M implementation is progressing. And, ideally, the findings can help inform next steps for district and site leaders to reinvest in implementation approaches that are directly responsive to the areas of need that have been articulated.

As an evaluation team working with the districts over the past year, we have learned about the variety of strategies within and across districts to support the transition to CCSS-M. MiC districts have developed their *vision* of CCSS-M-aligned instruction and have concurrently implemented specific district- and school-level strategies for supporting teachers in their instructional shifts. Accordingly, the survey was intended to serve as a catalyst for assessing these current approaches: Do the survey findings validate current approaches? Or are there opportunities for redeploying resources that more closely align with what teachers say can help support their implementation efforts?

We conclude with the following considerations, drawn from the survey results as well as our interactions with MiC districts over the past year:

» The survey captures the views of nearly 1,000 mathematics teachers in eight California districts. The teachers, in general, are upbeat about the opportunity that CCSS-M affords them and their students. While there is much work to do, the general direction of working to implement the content and practice standards is productive and purposeful. We simply note that these sentiments were reported by teachers who responded to the survey, and that a large group of teachers in these eight districts opted *not* to respond. *It is an open question whether or not non-responding teachers share these sentiments, and we encourage district and site leaders to consider how to generalize from these data.*

» The survey results signal to us that the optimism that teachers report is somewhat inconsistent with their own understanding of CCSS-M, and in particular, their ability to meet the practice standards with their own instruction. This inconsistency is born out by several survey items that report conflicting perspectives on teachers' familiarity with the level and depth of content and pedagogical knowledge that the standards require. *An implication is that district and site leaders should be careful to maintain objective measurement strategies that record instruction in real time in order to accurately compare next year to this year and to mitigate against some of the anecdotal reporting of improvements in instruction that might be prevalent in some locations.*

» Currently, the teachers indicated that the primary support for CCSS-M implementation is delivered through district-sponsored professional development activities.[3] Teachers report that their single greatest professional development time commitment is spent listening to experts. Simultaneously, the teachers report that they need more time observing CCSS-M instruction, and opportunities to improve their instruction through practice bringing CCSS-M ideas to life. *These latter strategies are likely to be school-site level strategies, enabled*

3 The survey did not ask specifically about school-sponsored professional development.

by site principals, where professional learning communities, instructional walk-throughs, and embedded coaching models can support professional development and improvement through peer-to-peer networks.

» Instructional materials adoption is ongoing across the MiC districts. Districts have been developing curricular units, lessons, modules, and performance tasks and making these a focus of professional development. The results of the survey signal to us that mathematics teachers need more guidance on the use of approved instructional materials. The perception is that district staff control these materials, but teachers need them now. *Clarifying current policy and practice around instructional materials adoption, purchase, effective use, and alignment with CCSS-M should be a high priority for districts at this time of CCSS-M implementation, if these concerns have not already been addressed.*

» The teacher survey data are clear that additional support for English learners and struggling learners in CCSS-M implementation is needed. With the release of the first Smarter Balanced operational assessment results in summer 2015, districts have their first opportunity to look at student results. These data can be examined from many different perspectives, including using the data to signal where additional resources and supports can be directed. *District, site-level, and grade-level analyses of Smarter Balanced assessment scores provide an opportunity to triangulate teacher needs, students' scores, and professional development investments.*

» Teachers across the MiC districts report through the survey that they are receiving implementation support in several different ways. Yet beyond the scope of these data is a question about whether specific targeted professional development is meeting teachers' needs and helping teachers sustain shifts in practice. These varied professional development efforts are costly—in time, money, and in the countless logistics that are needed to organize and implement systematic support for teachers. *Feedback from teachers, specifically, should be a component of all professional development investments that are being made by districts. Simple surveys and evaluation feedback forms should be used regularly to include teachers' assessments of whether the investments are beneficial and how those investments could be redeployed.*

We encourage readers to reflect on and discuss the data and Lens into District Practice examples included throughout this report; reflect on their current context-specific policies and practices; and develop interpretations and action plans to inform and improve their CCSS-M implementation.

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Appendix A: Research Methodology and Survey Sample

METHODOLOGY

To inform WestEd's development of the survey, we conducted a review of the literature on implementation of education reform broadly and on CCSS-M more specifically. We identified recent reports and surveys detailing implementation successes and challenges, focusing in particular on implementation of mathematics reform. Based on the literature review, we generated a list of hypotheses about how districts might demonstrate CCSS-M implementation across a range of activities at both early and later stages of implementation. For example, we hypothesized that while the CCSS-M were just beginning to be rolled out broadly in California schools during the 2014–15 school year, over time educators' varied understandings of the standards would solidify and district stakeholders would begin to agree about the central ideas, priorities, and sequence of actions needed to achieve full implementation of the CCSS-M.

Using such hypotheses to ground our survey development, we identified CCSS-M-related survey items from existing instruments, to the extent that they were available at this early stage of CCSS-M implementation (Arizona Department of Education, 2013; California Department of Education, n.d.; CRC, 1994; Clifford, 2014; Colorado Department of Education, 2012; Council of Great City Schools, 2013; Cristol & Ramsey, 2014; Illinois State Board of Education, 2014; Malzahn, 2002; McLaughlin & Talbert, 2001; Oregon Department of Education, 2013; Student Achievement Partners, 2015; Walters et al., 2014). When we did not find existing survey items to pull from on topics of interest, WestEd staff developed new items. WestEd asked several representatives from MiC partner organizations to review the surveys for content and clarity, and we subsequently pilot-tested the surveys with small groups of teachers and principals outside of the MiC community to assess the time needed to complete the surveys and the overall clarity of the individual questions and of the instrument as a whole.

An important feature of the survey development was to capture both the unique and shared perspectives on implementation from stakeholders in different job roles. We were interested in ideas about instruction from teachers (e.g., what instructional practices they used to support CCSS-M) and ideas about leadership from administrators (e.g., the steps they had taken thus far to support CCSS-M implementation in their schools and districts). At the same time, we were also interested in the coherence of ideas across groups, such as whether administrators and teachers agree on which instructional practices are most important to support CCSS-M. To get at these ideas of coherence, we included verbatim or parallel questions across the three groups being surveyed to the extent possible.

Survey items

Teachers were asked 25 questions (totaling 116 items, with sub-questions); site administrators were asked 24 questions (totaling 128 items); district administrators were asked 21 questions (totaling 125 items).

The surveys focused on several key implementation areas, including professional learning opportunities, vision for CCSS-M implementation, curriculum and instruction, preparedness to enact and implement the CCSS-M, and respondent background. The surveys included Likert-scale items asking respondents to rate the extent to which they agreed or disagreed with statements about CCSS-M; forced-choice items (e.g., on instructional materials use); and open-response items asking respondents to elaborate on opinions about the CCSS-M (e.g., regarding needs for effective implementation or expectations about the district and school system of the future under CCSS-M implementation).

The figure below illustrates how one question about instructional practices was asked of the three respondent groups (one sub-item example of 15 possible is shown).

Figure A1. Example of Parallel Survey Questions Given to Teachers, Site Administrators, and District Administrators

Teachers: *How often do you typically use the following instructional practices to teach the Common Core State Standards during your mathematics lessons?*

ITEM EXAMPLE	NEVER	RARELY (E.G., A FEW TIMES A YEAR)	SOMETIMES (E.G., ONCE OR TWICE A MONTH)	OFTEN (E.G., ONCE OR TWICE A WEEK)	ALL OR ALMOST ALL MATHEMATICS LESSONS
a. Structuring class time for students to develop procedural skill and fluency in core operations (such as multiplication tables) so they can solve more complex math problems.	1	2	3	4	5

Site Administrators: *How important do your mathematics teachers believe each of the following instructional practices is to be able to teach the CCSS-M effectively?*

ITEM EXAMPLE	NOT AT ALL IMPORTANT	SLIGHTLY IMPORTANT	MODERATELY IMPORTANT	VERY IMPORTANT	EXTREMELY IMPORTANT	DON'T KNOW
a. Structuring class time for students to develop procedural skill and fluency in core operations (such as multiplication tables) so they can solve more complex math problems.	1	2	3	4	5	6

District Administrators: *How important do mathematics teachers in your district believe each of the following instructional practices is to be able to teach the CCSS-M effectively?*

ITEM EXAMPLE	NOT AT ALL IMPORTANT	SLIGHTLY IMPORTANT	MODERATELY IMPORTANT	VERY IMPORTANT	EXTREMELY IMPORTANT	DON'T KNOW
a. Structuring class time for students to develop procedural skill and fluency in core operations (such as multiplication tables) so they can solve more complex math problems.	1	2	3	4	5	6

Survey administration

Surveys were administered in eight of ten Math in Common (MiC) districts; two districts opted not to participate. Over the five-week administration period, non-respondents were sent two follow-up email reminders requesting their participation. Each respondent was eligible to receive a five-dollar Starbucks gift card as a small token of appreciation for their participation. Response rates varied significantly by group and district, ranging from 12–43% across the districts for teachers, 9–68% for site administrators, and 6–67% for district administrators.[4] Lower response rates were found in districts with shorter administration periods; higher response rates were found in smaller districts in which administrators made extra efforts to encourage staff participation.[5] Despite these varying response rates by district, we were able to gather total responses from 33 district administrators, 122 site administrators, and 990 teachers across eight MiC districts.

PLANS FOR SUBSEQUENT SURVEY ADMINISTRATION

The survey was developed for first-time use during the 2014–15 school year, the same year that districts were scheduled to roll out the spring Smarter Balanced assessment for students in grades 3–8 and 11. Given that the Smarter Balanced assessment roll-out was scheduled to occur after the survey administration period, our survey did not ask many questions about assessment. In subsequent years, we will add items to better understand MiC stakeholder perspectives on assessment.

Additionally, the extent to which staff find efficacy in district-supported policies and practices will also be an important addition to upcoming surveys. Although previous studies have found "a lack of evidence that it matters very much which textbook schools choose" (Slavin et al., 2008), when Kramer and colleagues considered school buy-in to the curriculum as an interacting effect, they found that the choice of curriculum materials is important (Kramer, Cai, & Merlino, 2015). The ways in which teacher ownership interacts in the MiC districts with the districts' different curriculum strategies, and potentially other CCSS practices the districts use, may reveal interesting patterns. While we included items on teacher decision-making in the 2015 surveys, we expect that items on teacher ownership of reform ideas may result in more useful analyses.

Finally, survey development time limitations prevented us from customizing the instrument to the needs of the individual MiC districts, with their own unique questions about CCSS-M implementation. With additional lead-time prior to subsequent survey administrations, we will ask MiC leaders to suggest additional areas to include in the survey that might produce data of use in informing their goal-setting and planning efforts. We will also likely shorten the surveys significantly to reduce the time burden on respondents and improve response to questions at the end of the survey.

RESPONDENT SAMPLE

As described above, we received responses from 990 teachers, 122 site administrators, and 33 district administrators. We asked teachers several questions to understand the nature of their teaching assignment, including whether they currently had a classroom or were without a classroom (e.g., coach or teacher on special assignment); whether their assignment was as a specialist teacher or a teacher with a self-contained classroom; what their school type (elementary, middle, K-8) was; and what specific grade levels they taught in 2014–15. Although we had hoped to use these questions

4 Response rates could be measured only for districts that received invitations directly from WestEd (six districts) versus receiving them directly from their own district MiC liaisons (two districts).

5 The administration period lasted slightly longer than a month for most districts. Some difficulty obtaining staff contact information in two districts delayed their invitation to participate and, as a result, the administration period in these districts was only three weeks long.

to identify elementary or middle grade teachers and understand responses patterns to other survey items by grade span, missing data complicated this categorization. Acknowledging these missing data, the majority (59%) of our sample were elementary teachers, and 11% of responding teachers were middle school teachers; 30% of teachers did not indicate their grade level. As Table A1 shows, the majority of responding teachers had been teaching for more than 10 years, and only a small percentage had a mathematics major or credential.

Table A1. Characteristics of the Math in Common Survey Teacher Respondents

	ELEMENTARY TEACHERS	MIDDLE SCHOOL TEACHERS	TEACHERS WITH NO GRADE LEVEL INDICATED
Teaching Experience			
0–2 years	8%	14%	12%
3–5 years	6%	12%	9%
6–10 years	14%	21%	17%
11–20 years	43%	32%	37%
> 20 years	29%	21%	25%
Mathematics Teacher Degree/ Credential*			
Undergraduate Mathematics (Major or Minor)	3%	3%	0.4%
Mathematics Graduate Degree	2%	0.5%	0.2%
Secondary or Other Credential in Mathematics	3.5%	7.9%	0.7%

* Respondents could select all that apply.

Appendix B: Sample Survey Item and Sub-Items

For context on what the survey items look like and how the responses were tabulated, the following is a sample of a survey item (and its sub-items) that was given to site administrators asking them about their preparation to support CCSS-M implementation at their school.

Table B1. Sample Survey Item and Response Percentages from Site Administrator Survey

PLEASE RATE THE EXTENT TO WHICH YOU ARE PREPARED TO SUPPORT IMPLEMENTATION OF THE CCSS-M AT YOUR SCHOOL ON EACH OF THE FOLLOWING FACTORS						
	NOT AT ALL	TO A MINIMAL EXTENT	TO A MODERATE EXTENT	TO A GOOD EXTENT	TO A GREAT EXTENT	OVERALL MEAN (STANDARD DEVIATION)
Communicating the Need						
Convey what the CCSS-M are about to your teachers and school staff	4%	12%	33%	38%	14%	3.46 (0.99)
Influence teachers' motivation to implement the CCSS-M	2%	10%	29%	44%	15%	3.61 (0.93)
Clearly communicate to teachers the types of changes required by the CCSS-M (e.g., deeper content, Standards for Mathematical Practice)	2%	13%	27%	41%	17%	3.59 (0.98)
Prioritize CCSS-M implementation	2%	11%	22%	45%	21%	3.72 (0.98)
Supporting Teacher Change						
Plan effective professional learning to facilitate CCSS-M implementation	5%	25%	28%	35%	8%	3.17 (1.04)
Provide effective instructional models for teachers to support CCSS-M implementation in the classroom	9%	17%	36%	30%	7%	3.09 (1.06)
Access practical how-to guidance to support the necessary changes in instruction	6%	25%	40%	21%	8%	3.01 (1.01)
Make high-quality professional development available to teachers	5%	19%	24%	36%	16%	3.41 (1.11)
Budget and allocate resources to support effective CCSS-M implementation	10%	16%	26%	36%	13%	3.26 (1.17)
Ensure that instructional coaches can provide effective guidance on CCSS-M implementation	10%	11%	33%	30%	16%	3.32 (1.17)

PLEASE RATE THE EXTENT TO WHICH YOU ARE PREPARED TO SUPPORT IMPLEMENTATION OF THE CCSS-M AT YOUR SCHOOL ON EACH OF THE FOLLOWING FACTORS	NOT AT ALL	TO A MINIMAL EXTENT	TO A MODERATE EXTENT	TO A GOOD EXTENT	TO A GREAT EXTENT	OVERALL MEAN (STANDARD DEVIATION)
Integrating Practices into the Organization						
Align the school's curriculum and instructional focus	3%	9%	31%	43%	15%	3.57 (0.94)
Evaluate teachers on CCSS-M implementation	3%	9%	35%	43%	11%	3.50 (0.91)
Ensure that standards-aligned programs are in place to support students who struggle academically	5%	15%	31%	35%	13%	3.35 (1.06)
Use expanded learning opportunities (e.g., extended day, after school, summer programs) to support CCSS-M attainment	9%	20%	26%	33%	12%	3.18 (1.16)
Integrate the CCSS-M with programs serving English learners, special education students, or students in other subgroups	6%	16%	28%	40%	9%	3.29 (1.05)

Note: (n=107–111)