



**What Accelerates a Community of Practice?** Inflection Points That Changed the Course of the Math in Common Initiative



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# Introduction

Establishing professional communities of educators from districts and schools has gained popularity as a mechanism for collaboratively thinking through and enacting change in education. Modeled on successful practices in business and healthcare, education-focused networks embody the belief that “learning is better together” (Bryk, Gomez, Grunow, & LeMahieu, 2015) — that a group of organizations or individuals can learn more quickly and effectively by working together than by working in isolation.

In 2013, 10 California school districts received grant funding from the S. D. Bechtel, Jr. Foundation (“the Foundation”) to participate in the Math in Common (MiC) initiative to support implementation of the Common Core State Standards for Mathematics (CCSS-M) (NGA Center & CCSSO, 2010). The districts were located across the state, ranging in size and characteristics, from large urban districts to small rural districts. A portion of the grant funding to the districts was dedicated to enabling their participation in a community of practice (CoP) to “share lessons learned with each other [about implementing the CCSS-M] and participate in learning communities to share instructional materials and best practices” (S. D. Bechtel, Jr. Foundation, 2012).

Rather than creating a “networked improvement community,” whose collaborative work is driven by a very targeted and specific common problem of practice or improvement aim,<sup>1</sup> MiC organized its CoP around collective learning about mathematics

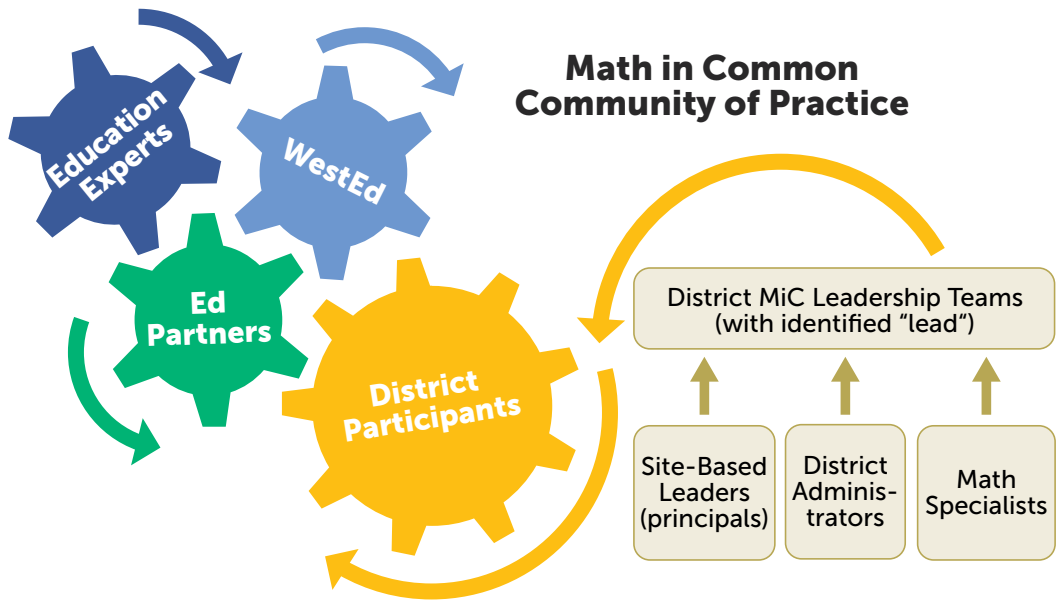
standards implementation in a very broad sense.

The trajectory of the MiC CoP was guided by the convening organization, California Education Partners (“Ed Partners”), in response to direct engagement with the districts and their perceived needs over the course of the initiative. WestEd worked alongside Ed Partners and the districts, using evaluation findings to help hone the CoP’s focus, ensure that the work was data-driven, and support capacity building. Figure 1 shows the participants in the MiC CoP.

While it is difficult to condense the rich array of the initiative’s activities into one linear timeline, it does seem that the initiative can be divided into two fairly distinct phases. This report describes how the MiC CoP gradually honed its focus over the first five years of the initiative. It begins by describing actions taken early in the initiative that laid important foundations for the CoP. During this first phase (2013–2015), Ed Partners devoted significant effort to developing the structure of the CoP, offering a range of potential focal ideas to the CoP, and building trusting relationships across the districts. The report’s discussion of the second phase, building on these earlier efforts, highlights what we have identified as the seven most significant *inflection points* — that is, points where the trajectory of the MiC CoP changed. These seven inflection points resulted from lessons learned from the earlier years and, in most cases, led to more productive collaborative work in the later years of the initiative, when work shifted

1 Other recent education networks have coalesced around pre-selected “problems of practice” such as social-emotional learning or improving grade 4 mathematics instruction for students of color. For example, information about the CORE-PACE research partnership can be found at <https://www.edpolicyinca.org/projects/core-pace-research-partnership>.

**Figure 1. Organizational and Individual Participants in the Math in Common Community of Practice**



from thinking broadly and generally about implementation to focusing far more specifically on classroom instruction and on how to achieve the mathematics instruction that districts were hoping for under the CCSS-M. Rather than providing a “how to” manual for CoPs, we intend for this report to describe

the trajectory of the MiC CoP, including both its missteps and its successes, in the hope that designers or participants of other formal or informal CoPs can leverage the MiC experience and make progress more quickly in their own collaborations.



# Phase 1: Building the Infrastructure of the Math in Common Community of Practice

The Foundation wanted the MiC CoP to be organized around the interests and needs of the districts. The first phase of the CoP helped surface these interests and needs, and enabled participants to begin building trusting relationships. In the first two years of the initiative, Ed Partners reviewed proposals, interviewed district staff, helped organize district MiC leadership teams, and ran CoP meetings aimed at eliciting guiding principles and familiarizing district staff with one another. This beginning work identified four organizing structures for the CoP, which guided the CoP's work over the five-year initiative and which also created opportunities for the inflection points that occurred later.

Specifically, these four primary<sup>2</sup> organizing structures for the MiC CoP were:

- I. District MiC leadership teams to engage in the work
- II. A set of guiding principles and annual improvement plans
- III. In-person learning opportunities in a variety of formats
- IV. Access to individuals with a broad range of diverse expertise

## I. District MiC leadership teams

With guidance from Ed Partners, each district organized an MiC leadership team composed of district staff with diverse roles (see Figure 1). While the MiC work permeated the math departments in the participating districts, the members of the leadership team created and participated in the CoP. The sizes and compositions of the leadership teams varied over the five years and across districts, more in some districts than in others. Each district selected an MiC coordinator or lead who acted as a liaison between the district and the CoP, Ed Partners, WestEd, and other districts, and also convened the district's MiC leadership team.

## II. Guiding principles and annual improvement plans

During the first phase, Ed Partners conducted site visits and interviews with district staff to develop and modify a draft Community of Practice Framework (Ed Partners, 2013). This framework included defining features of the MiC CoP, including its mission, vision, and assumptions about how participants were to work together; commitments and values; overall approach; and five-year measurable goals, as shown in Figure 2.

The Community of Practice Framework also included outcomes centered around four common areas for participants' work: Vision, Content, and Process (VCP) and Innovation. Ed Partners developed a VCP rubric to assess

<sup>2</sup> Although these four structures were the most prominent in the CoP, they are far from a complete set of influences on the CoP. For example, this list of structures does not reflect the more informal connections (e.g., emails, phone calls, meetings) among MiC members from different districts, which occurred both with and without the involvement of Ed Partners staff. These informal, participant-driven connections may be one of the best indicators of the health of the CoP and one of the more sustainable results in the long term.

## Figure 2. Math in Common Community of Practice’s Five-Year Measurable Goals

1. Build confidence and professional capacity as teams and as individuals.
2. Share resources, knowledge, tools, and approaches, both in-person and virtually.
3. Work as district [MiC leadership] teams to refine district visions and approaches to math instruction and assessment.
4. Work across district [MiC leadership] teams to improve practice and generate new knowledge about math implementation.
5. Model empowered professional learning.

Source: Ed Partners (2013).

progress and drive annual improvement plans in each of these three areas. (This report does not focus on innovation because it was treated as a separate strand of work with other district participants.) VCP and the associated rubric are discussed in the following section.

### Vision, Content, and Process

Vision, Content, and Process (VCP) became a hallmark of the MiC work. Beginning with the 2014–15 school year (the second year of the grant), each member district was asked to annually develop, execute, and update a continuous improvement plan for its K–8 math standards implementation work. These improvement plans were composed of three elements: *vision* that is shared and communicated across the system, strong *content* that serves as the focus for the vision and for capacity building, and a *process* for building learning and capacity among those responsible for implementation.

Prior to each MiC convening, district MiC leadership teams were asked to do prep work together, using the VCP rubric to reflect on the annual improvement plans and on progress within each area of the rubric, toward their respective goals for each area. (Figure 3 shows the “vision” portion of the VCP rubric.) This prep work was intended not only to support teams’ reflection and to sustain momentum between convenings, but also to serve as a form of mutual accountability.

Summaries of districts’ prep work were turned into large posters, shared at the convenings, and used as inputs for within- and cross-district reflections on progress.

### Innovation

The fourth area of work, innovation, quickly became important enough to garner its own strand of work. This work included training with Stanford Design School experts, to help districts use a design thinking approach to integrate the use of technology into their mathematics improvement efforts. Ed Partners



Having Ed Partners and WestEd and the level of speakers that come and work with us – those are all added bonuses to it. It’s like a PLC that’s on steroids.”  
— MiC participant

initially organized this strand of work as separate from the work of the main leadership team (including different district participants). In the later years of the initiative, greater efforts were made to integrate this strand of work





Figure 3. Vision Portion of the VCP Rubric

## I. Vision Rubric

**A. VISION – Student Achievement in Mathematics:** Each district will:

- i. develop and implement a shared, coherent, non-negotiable and compelling vision for mathematics instruction and assessment,
- ii. be able to demonstrate progress towards a district-wide understanding of that vision, and
- iii. establish and describe a multi-tiered evidence-gathering program that advances the math vision.

	4	3	2	1	Score
A 1	We have a coherent, non-negotiable, and compelling vision for mathematics instruction and assessment.	We have a draft vision, and have <b>made progress</b> toward modifying it according to feedback.	We have a draft vision and <b>have a plan</b> to share it and get feedback.	We are <b>developing a</b> vision.	?
A 2	<b>Everyone</b> on our district (not just MiC) leadership team owns the vision, can name the vision, and bases their work in that vision.	We have <b>made progress</b> with our leadership team's ownership of our vision, with at least 75% of members being able to name the vision and base their work...	We <b>have a plan</b> , and have shared it with our leadership team, to increase the leadership team's ownership	We are <b>developing a plan</b> to increase ownership of the vision on our leadership team.	?

Source: Ed Partners (2014).

into the work of the CoP. A full review of this work is outside the scope of this report; we mention it here to indicate that a subset of the initiative was focused on the common (and complex) problem of integrating technology into instructional improvement.

### III. In-person learning opportunities

The structure that Ed Partners set up for the districts' in-person shared work and learning was an important piece of the initiative. Because CoPs were relatively unfamiliar to education organizations when MiC began, Ed Partners was, in many ways, pioneering a new approach to crafting meetings for collaborative learning. The elements of the CoP's in-person meetings that contributed most heavily to the inflection points include:

- **Convenings:** Ed Partners organized two-day convenings for the MiC leadership teams in the fall, winter, and spring of each school year. These convenings were the primary organizing mechanism for districts' annual cycles of inquiry around their improvement plans. Leadership

convenings gave district representatives time to connect in-person around implementation strategies and to build trusting "bridges" for information-sharing across districts. (Throughout this report, we provide text boxes featuring vignettes of "The View from the Field" as examples of the various activities that occurred at convenings.)

- **Workshops:** Ed Partners organized workshops outside of the convenings, led by external experts, to enable the CoP to further share ideas and learning.
- **Site-visit consultancies:** Districts also were asked to host "site-visit consultancies" to showcase specific local-implementation activities.

### IV. Access to individuals with diverse expertise

The MiC districts benefited from three primary types of expertise brought into the in-person learning opportunities:

- **Outside expertise** from leaders in the field of education



- **Inside and outside expertise** from the evaluation partnership with WestEd
- **Inside expertise** from their peers in the MiC CoP

### Outside expertise

Ed Partners' approach to using outside expertise shifted over time, from offering districts exposure to a range of ideas at every meeting to carefully tailoring experts' presentations to dovetail with the needs and themes emerging from the CoP's work together. This shift mirrored shifts in the CoP itself, as it moved from a diverse group of districts with seemingly little in common and no particular focus for their work in the CoP, in the first phase of the initiative, to a community with common areas of work and many points of contact, in the second phase. We believe that both approaches were useful during their respective phases.

In its initial interviews with districts, Ed Partners noted the "high-demand experts" that participants sought for guidance with their math implementation. In the first year of the initiative, Tim Kanold was brought in as the leading expert for the CoP, and he continued in an expert role over the course of the initiative, although he provided somewhat less guidance as the initiative progressed. In the first phase, other well-respected education experts, such as Dylan Wiliam, Kenji Hakuta, and Jo Boaler,

were also invited to speak, on topics ranging from professional learning communities for instructional improvement to improving educational opportunities for language-minority students through academic discourse. The text box *The View from the Field: Spring 2015 Convening* describes how one math educator's expertise was presented during a convening.

### Inside and outside expertise

Throughout the initiative, WestEd provided knowledge and expertise in its dual roles as developmental evaluator and technical assistance provider. As the evaluator and as a member of the CoP, WestEd gathered information and data on focus topics from participating districts. Over the course of the initiative, drawing on the information and data, WestEd developed more than a dozen written formative evaluation reports to share with the CoP and to guide convening discussions and learning (see the Math in Common evaluation webpage for a complete listing of reports: <https://www.wested.org/project/math-in-common-evaluation/>). Topics for these reports included:

- Analyses of WestEd's yearly survey of MiC teachers' and principals' attitudes toward implementing standards
- Case studies of implementation approaches for organizing professional

## The View from the Field

### Spring 2015 Convening: Formative Assessment Lessons and Classroom Observations

Kim Seashore, a member of the UC Berkeley Teaching for Robust Understanding (TRU) research team, presented information from a Mathematics Assessment Resource Service (MARS) Formative Assessment Lesson on steps to solving equations. Participants did the mathematics of the lesson, watched video of teachers implementing the lesson, and discussed implications for classroom observations, referencing the TRU framework (Schoenfeld, 2014). Several participating districts were already using Formative Assessment Lessons and MARS assessment tasks. These tasks, and the TRU framework, would be taken up by other MiC districts and used more broadly across the MiC districts over the course of the initiative.



development, providing instructional leadership, and developing interlocking structural implementation supports

- Guidelines on developing classroom observation systems

The reports were shared with the CoP, sometimes via a 90-minute session at a convening.

Additionally, a dedicated WestEd staff liaison worked with each district MiC leadership team as a thought partner to support CCSS-M implementation and participation in the CoP. As leaders in various fields of education research and practice, WestEd staff were frequently invited to share their expertise during convenings and workshops on such topics as lesson study (a form of collaborative professional development), classroom structures to support English learners in mathematics, the structure and purpose of the California Assessment of Student Performance and Progress (CAASPP), and systems of support for students with disabilities. And a WestEd staff member external to the CoP provided feedback to Ed Partners to shape the direction of the CoP. In these multiple capacities, WestEd was a source of both inside and outside expertise.

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### Inside expertise

From the beginning of the initiative, Ed Partners positioned the districts themselves as experts in implementation. District MiC leadership teams frequently shared their

experiences as experts in practice during convenings and during site-visit consultancies, such as the consultancy described in the text box *The View from the Field: Winter 2016 Site-Visit Consultancy*. Participants reported that some of the most pivotal and meaningful activities occurred during these cross-district sharing opportunities. Site-visit consultancies became increasingly central to the work as the initiative progressed.

## Summary of MiC's early years: Foundation for continued learning

The community-building aspects of the initiative were very successful in the early years, according to district grant reports, WestEd observations and discussions during convenings, and WestEd evaluation reports (Bugler, 2015, 2016). All of these data sources suggest that, despite large differences of size and scale across districts, participants discovered that they could learn about implementation from the experiences of other districts. The sessions with outside experts, presented by Ed Partners, were also largely successful, and more than a few districts contracted directly with the experts for additional support.

Perhaps the most successful tactics in this early phase were around community building. At each convening, Ed Partners organized agenda sessions to accomplish various community goals, including time

### The View from the Field

#### Fall 2017 Convening: Developing Teacher Expertise to Work with English Learners

Leslie Hamburger, co-director of WestEd's Quality Teaching for English Learners project, described six domains of expertise that are required for effective teaching of English learners. She supported district MiC leadership teams in developing their own theories of what constitutes teacher expertise for work with English learners, and in creating district professional learning plans to support the development of such expertise. After this convening, several districts requested additional direct support from her.



for district MiC leadership teams to work together and time for individuals to work across teams. Especially in this phase, the cross-team discussions enabled participants to learn about similarities and differences in focus. These discussions also helped to establish some common language among participants and across districts, which was necessary before learning about specifics. As a simple example, for participants to be able to learn what coaches in other districts really do with their time to support implementation, it was important to know that coaches serving the same function might be called “training specialists” in one district and “teachers on special assignment” in another. Through these conversations, a discourse community, which supported cross-district collaborative problem solving, was developed for the MiC participants.

The foundational efforts to build the cohesiveness of the CoP during the early years of the initiative could not have been bypassed. Building participant understanding of the purpose of the CoP, obtaining buy-in for the CoP, and supporting strong and collaborative relationships were central to



**It’s nice to know that we have that community that’s . . . solving an issue together — not just as individual districts, but as a collaborative.”**  
— MiC participant

the CoP’s evolution. We wonder, however, if acceleration to the next phase of the CoP’s work — which involved stronger and more specific common foci for collaborative work — could have happened more quickly by starting with a more narrow, targeted focus for the CoP from the beginning. In the subsequent phase of the initiative, theory and targeted data were both used to guide the districts’ improvement efforts toward narrower objectives. Leadership teams also made stronger efforts to incorporate the expertise of both district- and site-level administrators to help the teams realize targeted aspects of their visions of standards implementation.

## The View from the Field

### Winter 2016 Site-Visit Consultancy: Showcasing Lesson Study

In January 2016, Oakland Unified School District hosted a site-visit consultancy to showcase its approach to lesson study. The purpose of the event was to enable cross-district participants to discuss several essential questions and learn about how to effectively design and implement lesson study. (Oakland had been implementing lesson study carefully for several years, in collaboration with education researchers Catherine Lewis and Akihiko Takahashi.)

At the beginning of the event, Oakland mathematics leaders shared their district math vision and the ways in which they used lesson study to support this vision. The district mathematics team (most of whom were part of the district MiC leadership team) also demonstrated the components of their lesson study approach: a pre-briefing and review of the lesson plan; a live in-class lesson (with data gathering by participants); and a post-lesson debriefing supported by district math specialists and by Takahashi. After the lesson and the debriefing, participants engaged in a cross-district conversation about system supports that need to be in place for lesson study to be an effective improvement strategy; teams from eight MiC districts participated.

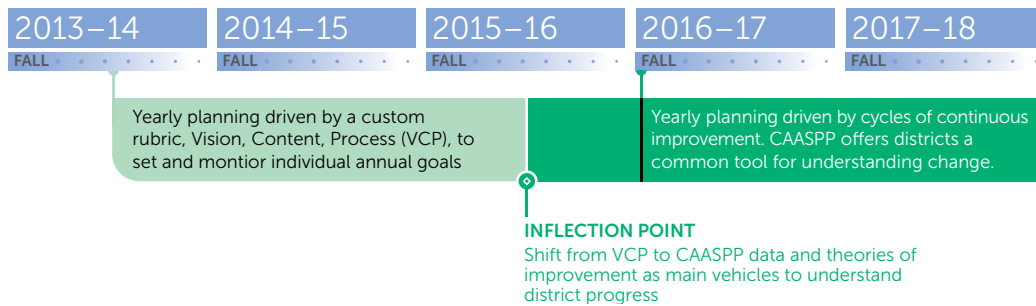
## Phase 2: Inflection Points

The later years of the MiC initiative included several inflection points at which the CoP's work started to display greater cohesion and shared focus, which catalyzed teams to move further and go deeper in their CCSS-M implementation efforts. In effect, these inflection points demonstrated the complex, nonlinear trajectory of how learning can happen within a CoP as its members work to create coherence from an extensive amount of information provided to them and from interactions in which they engaged.

There were many major and minor inflection points for the MiC CoP over the course of the initiative. We are not able to document all of the minor inflection points — the exciting “lightbulb moments” experienced by individuals and teams, the relationships built, the subtle shifts as teams learned how to work together better, the senses of personal and professional development that many participants reported feeling as a result of their participation in MiC. However, we have identified several major inflection points, which are detailed throughout this section. It is our hope that as CoPs become a more common method for educational improvement, new communities can learn from the inflection points captured in this report.

## Inflection point 1: Annual improvement cycles become grounded in theories of improvement

*Seeded by experts highlighting the importance of having a systemic vision of mathematics improvement to guide annual improvement cycles, the CoP gave districts more opportunities to develop and test theories of improvement. As a result, leadership teams began to evaluate improvement initiatives in relation to their districts' overarching improvement theories.*



Inspired by the work of Tim Kanold (2012), early convening discussions focused heavily on having districts develop math vision statements. Teams were asked to think about questions such as “What is our districtwide, coherent, non-negotiable, and compelling vision for mathematics instruction and assessment? How are we engaging others with that vision to ensure it’s implemented in every classroom? What will that take?” (Ed Partners, 2014a). These vision statements described inspiring visions for student success and provided organizational direction, encouraging districts to think carefully about how their systems were designed to achieve their visions. The sidebar *2015–16 Vision Improvement Goals for Two Districts (Fall 2015)* shows vision improvement goals for two districts, from the beginning of the 2015–16 school year.

While they were learning about and developing vision statements, participants seemed to not always be sure of what elements of improvement the vision statements should capture. In addition, participants did not frequently consult (or use or revise) the vision statements on a regular basis outside of convenings. As a result, during convenings in the early phase of MiC, district MiC leadership teams were often asked to

reconsider how well their vision statements aligned with their current improvement goals, and to revise the statements as necessary. Revisions were especially likely when a new member joined the leadership team. These semantic revisions of the vision statements sometimes did not feel like a productive use of rare shared time for teams that wanted to make progress and gain clarity about the specifics of mathematics implementation.

As with several of the inflection points described in the following sections, the



**The questions that are being asked are good in themselves to think about vision, process, and content, but they’re not related to the questions that we’re asking ourselves daily.”**  
— MiC participant

MiC leadership teams began pushing for more specificity in the MiC work, at the

2015–16 VISION IMPROVEMENT GOALS FOR TWO DISTRICTS (FALL 2015)

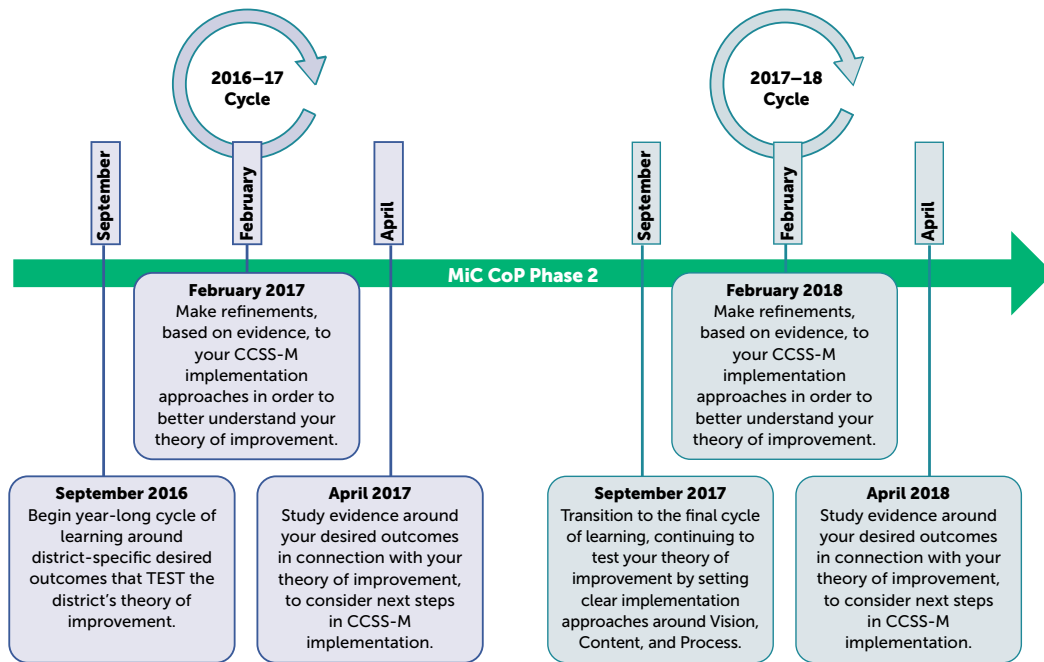
**Sacramento City:** “We will use the [district-developed] Data Gathering and Coaching Tool in 100 percent of our schools for gathering valid and reliable evidence to understand the degree to which current instructional practice aligns with our vision.”

**San Francisco:** “Build mathematically powerful classrooms grounded in the five dimensions of the TRU Math Rubric with an emphasis on Access to Mathematical Content so that students develop the agency, authority, and identity needed to be full partners in their own learning.”





Figure 4. Math in Common Community of Practice Timeline, 2016–18



Source: Ed Partners (2016).

same time that districts gained access to CAASPP student achievement data and to support for examining these data. In fall 2016, Ed Partners responded to these events by shifting the nature of the convenings to reflect a more targeted focus on theories of improvement, on evidence, and on how to build both into the improvement plans that the districts were creating each year (see the text box *The View from the Field: Fall 2016* on page 12). Accordingly, the CoP's annual inquiry cycles shifted away from refining vision statements, toward testing theories of improvement and using evidence gathered within districts to understand the districts' progress (see Figure 4 for an overview of inquiry cycles in 2016–17 and 2017–18). District participants began to ask themselves questions about

the proposed changes in their improvement theories, such as “How will I know if this works?” and “What data will show that?”



Two years ago, at our fall convening, [one district participant] walks out of there and [says], ‘Everything we walked in with is completely out the window.’ They rewrote all of their outcomes. They rewrote their vision — all of that.” — MiC participant

## The View from the Field

### Fall 2016: Ed Partners Incorporates Theory of Improvement

Ed Partners' prep work for the fall 2016 convening provided the following guidance to district MiC leadership teams:

"As we enter this third cycle of learning, the community is ready to continue its momentum and begin to work toward the key questions of *coherence and long-term sustainability* for the work. To set the stage for this next phase, we are asking each district [MiC leadership] team to continue the work from past years *in order to begin articulating its overall, long-term 'theory of continuous improvement' in mathematics*. . . . Grounded in that theory, each team, as usual, will also set its vision, process, and content desired outcomes for the 2016–17 school year to anchor its learning process and form the architecture of the CoP. From there, you will also identify the meaningful evidence that you will collect to monitor, understand, and share progress throughout the year. *To set the stage for this process, here is what should be true for your district BEFORE the September Leadership Convening:*

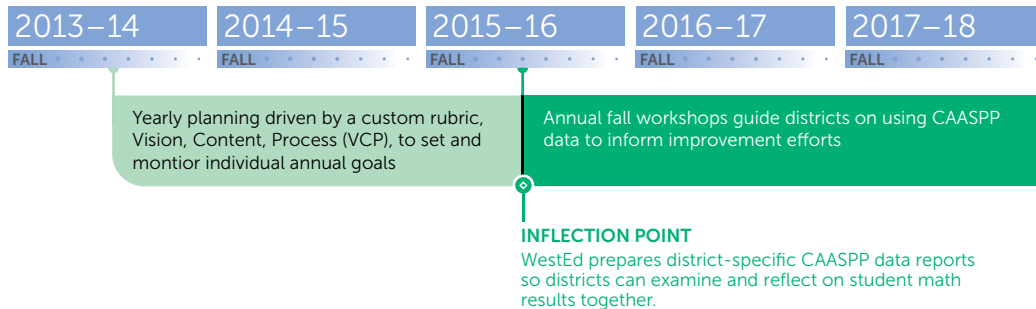
- Each individual will have reflected on, gathered evidence of, and shared progress to date (based on the MiC CoP rubric).
- Each district [MiC leadership] team will develop a very rough, early sketch of a 'theory of continuous improvement' for K–8 mathematics.
- Each team will set three desired outcomes for 2017 to 'test' that theory (vision, process, and content).
- Each team will identify the meaningful evidence it will collect and use throughout the year to understand its progress."





## Inflection point 2: Statewide math assessment becomes a useful source of data for improvement

*The CoP initially used the somewhat confusing VCP rubric to document and gauge progress on annual improvement cycles. As data from CAASPP, the statewide mathematics assessment, became available, the initiative was better able to use data to understand variations in achievement and to evaluate how district resource allocations affected improvement. As a result, the CoP grew in its capacity to use measurable goals and data for decision-making.*



As previously described, beginning with the 2014–15 school year, teams were asked to use the VCP rubric in their annual improvement cycles to assess progress toward their selected goals for the year for each area. Intended for “developmental purposes only” (i.e., were not used to formally evaluate team progress) (Ed Partners, 2014b), the rubric scores were challenging for teams to use.

**Challenges of using the VCP rubric.** One challenge was that the rubric lacked a standardized calibration and scoring system, making interpretation of scores over time, or across districts, difficult. For example, using the rubric for the vision goal (see Figure 3), if a district MiC leadership team scored itself a 3 (on a 4-point scale) in advance of one convening and a 2 in advance of the next, did the score difference mean that the district was backsliding, or did it mean that the district staff were learning more about what was required to implement certain ideas, and the later rating was more realistic?

Another challenge of the rubric was that the “process” and “content” elements were very broad, and the distinction between the two categories was unclear to many. As

defined in the rubric, the VCP elements were not aligned with district staff’s typical ways of thinking about improvement policies or data-gathering activities. For example, district leaders were used to thinking about professional development to support teachers’ pedagogical knowledge development. Even late in the initiative, these leaders were sometimes unclear about whether professional development activities should be analyzed



**You have to respond to the rubric about where you are in the process with your work. It feels a little forced . . . they don’t always align. It’s messy to me.” — MiC participant**

under the “process” category or the “content” category, and about which data-collection efforts would help demonstrate progress toward that goal.

Although continued usage of the rubric helped district MiC leadership teams learn how to use it better, the overlap between, and lack of clarity about, the goal areas diminished the potential impact of using the rubric to support cross-team learning during the early years of the initiative. One Ed Partners staff member reflected on the VCP rubric in the following way: “When we started MiC, we were . . . looking for common assessments [for districts to use]. . . . We came up with VCP . . . That worked for a while, but we weren’t getting people focused on improvement” (Ed Partners staff member, personal communication, December 5, 2018).

Ed Partners was hoping to strengthen MiC districts’ ability to monitor change. As a result, the CoP design relied on having evidence of student results to guide improvement, and the idea of monitoring implementation

progress was introduced early in the initiative, by expert partner Tim Kanold. However, districts often did not have good evidence to support their progress, or habits of engaging in data-informed improvement conversations with colleagues, which limited cross-district conversations about improvement within the CoP, as well as districts’ ability to use the VCP rubric to assess their progress.

**Availability of CAASPP data.** The availability of 2015 CAASPP mathematics results changed the nature of MiC leadership teams’ discussions. For the winter 2016 convening, WestEd prepared data tables so that each district could collaboratively examine and reflect on their student mathematics results. For example, they could use these tables to discuss the relationships between the results and the district’s allocation of resources and supports for school improvement (e.g.,

## The View from the Field

### Winter and Spring 2017 Convening: CAASPP School Profile Analyses and Data Discussions

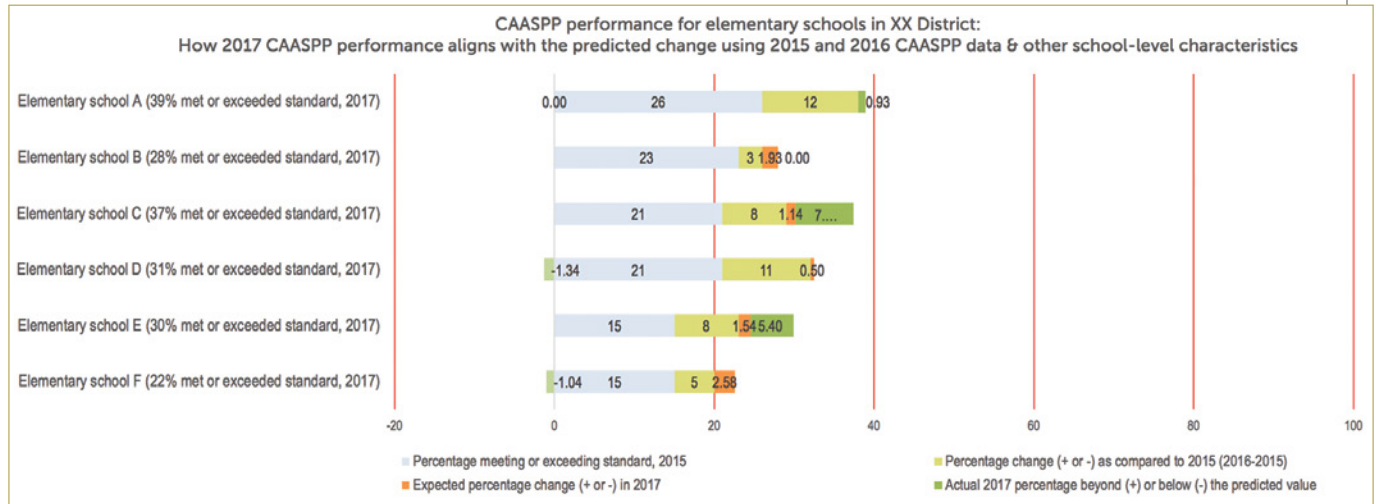
At the winter and spring 2017 MiC convenings, WestEd shared data illustrating how schools in each of the 10 MiC districts performed over two years, compared to predicted scores (see Figure 5 for a sample excerpt of the data shared with districts). After the data were posted, and in consultation with WestEd staff, MiC leadership team members were encouraged to ask several questions of the data they received, study each other’s results, and share observations. Questions they were asked to consider about the data included:

- What is the shape of achievement across the district, relative to the red reference bars (percentage of students meeting or exceeding standard)?
- How much spread (variability) along the x-axis is there within the district?
- How are schools performing in 2017 (green), relative to the prediction (orange)?
- Which schools are making continued progress? Which schools are not?

A subsequent convening session was devoted to having districts compare and contrast their own improvement structures, in relation to the achievement patterns that they were observing in the data.

These data discussions catalyzed district MiC leadership teams’ significant interest in receiving and discussing CAASPP data in subsequent years, in order to understand how patterns were shifting and what other districts were learning.

**Figure 5. Sample Excerpt of Data Illustrating How Schools in Each MiC District Performed over Two Years, Compared to Predicted Scores**



coaching support). Two and a half years into MiC, these CAASPP data grounded district MiC leadership teams in their examination of school-level achievement variation, and because the teams were looking at school performance through the lens of achievement data, the data could help them to be specific about their overall theory of improvement, their plans for reducing disparities in achievement (among school sites and among student populations across districts), and their path to improving student achievement overall.

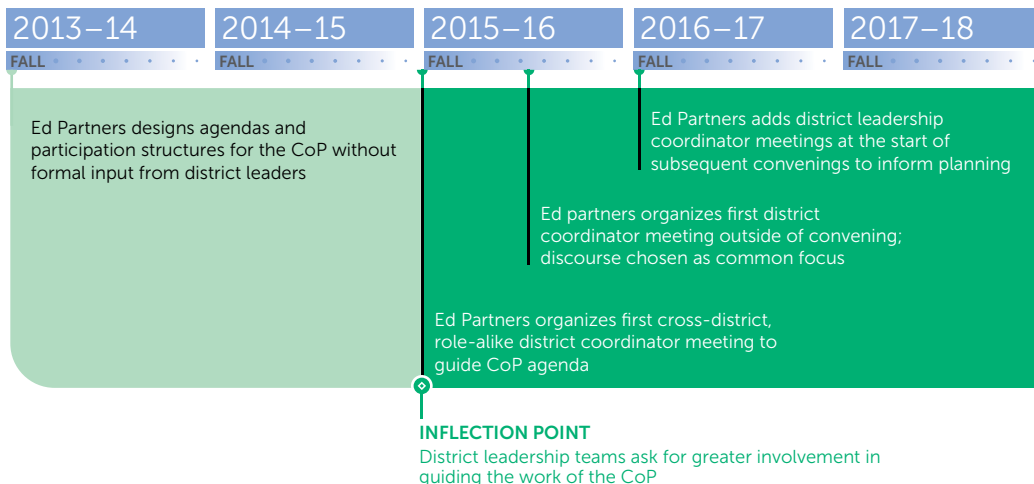
Each subsequent fall, WestEd provided similar CAASPP achievement analyses to districts, to continue to ground districts' discussions of achievement disparities and improvement strategies. Discussions of 2016 and 2017 CAASPP data were extended from a few hours to daylong sessions, allowing district MiC leadership teams more time to learn about CAASPP data from the WestEd team, discuss their within-district interventions, and share ideas with participants from other districts. These data-based discussions enabled district MiC leadership teams to consider how to link assessment results with specific instructional practices that they were encouraging teachers to use. It also allowed them to better understand how well schools were meeting the needs of different

groups of students. These analyses and discussions of CAASPP scores enabled the MiC CoP as a whole to become more sophisticated about learning from evidence of success within districts and at school sites.

In the later years of the initiative, the analysis of common sources of data alongside district theories of improvement seemed to accelerate districts' abilities to monitor their improvement activities. The focus on data supported districts in moving beyond the early challenges that they had encountered with vision statements and with the VCP rubric. Gathering meaningful evidence of progress, developing theories of improvement, and testing those theories drove the majority of discussions over the remaining two years of MiC. Although district MiC leadership teams are still learning how to think about and gather data on improvement, the leadership team members have grown more confident in thinking about data and data sources. Conversations between WestEd and district MiC leadership teams after the end of the MiC initiative have revealed that the idea of building an evidence base to test the usefulness of district initiatives was one of the districts' most common lessons learned about the implementation and sustainability of reform ideas.

### Inflection point 3: District MiC leadership team coordinators take greater authority for the direction of the community of practice

*As the CoP built trust, and after a WestEd evaluation report brought forth some participants' frustration with the CoP, district MiC leadership teams asked for greater involvement in setting the agenda for the work of the CoP. As a result, Ed Partners structured a small group of representatives from each district to meet regularly to guide the work of the CoP.*



At the end of the 2014–15 school year, a WestEd evaluation (Bugler, 2015) reported that the district MiC coordinators wanted a greater number of role-alike learning opportunities. Before this issue surfaced through the evaluation report, these coordinators did not have formal opportunities to meet and discuss their work leading their teams, and they reported feeling as though district participants had little say in the structure and content of the convenings. They told WestEd that they wanted to think together about how to best facilitate participation and learning in their district MiC leadership teams, and about how to spread their learning in their districts.

Subsequently, Ed Partners devoted more CoP convening time to cross-district role-alike discussions. Ed Partners also organized a “leads learning group” to engage the district MiC leadership team coordinators in conversations together outside of regular MiC convening activities. Over the final two years of the MiC initiative, this group met for

a two- to three-hour facilitated session prior to each CoP convening, and also met several other times in phone or video conferences. All of this collaboration enabled stronger connections across district MiC leadership teams as a whole, and created mechanisms for regular information-sharing about specific topics of interest within and across and within districts. (The topic of how to nurture mathematical discourse was discussed so extensively in the leads learning group that we describe the resulting work as a separate inflection point later in this report.) Through this work, some district MiC leadership team coordinators began providing support to their colleagues in other districts (e.g., advising on the planning of a summer institute) or helping to create national conference sessions together to represent MiC and share their learning.

After the first leads learning group meeting, the district team coordinators asked Ed Partners if they could have a more

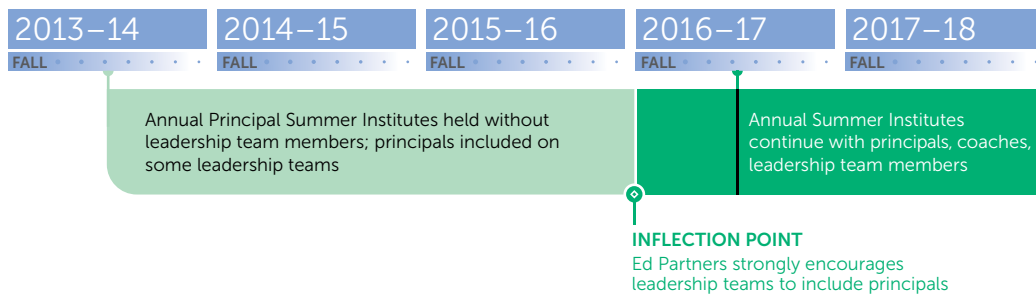


prominent role in defining the themes of the CoP convenings; they wanted to move on from convenings that covered many broad themes of implementation and get into the nitty-gritty of CCSS-M implementation. In the following school year (2015–16), based on input from the leads and other team members, Ed Partners responded by organizing the districts’ work together around

four themes: embedded formative assessment, classroom observation tools, lesson study, and strategies to promote student discourse. These themes subsequently enabled MiC participants to be more specific when comparing their learning and practices from the CoP with their ongoing CCSS-M implementation work in their home districts.

## Inflection point 4: Principals are more widely integrated into the community of practice

*Seeded by the desire to dig into the nitty-gritty of CCSS-M implementation, and driven in part by observations from summer principal institutes, MiC district leadership teams were strongly encouraged to include principals. As a result of including principals, CoP conversations were grounded in practice, cross-role collaboration was enhanced, and learning was spread more coherently and quickly to school sites.*



The integration of site-based leaders (principals or assistant principals) into the CoP, built on the foundation of principals’ participation in MiC summer institutes, became a significant inflection point (Reade, Perry, & Marple, 2019). District MiC leadership teams that included principals could draw on these site leaders’ knowledge of particular implementation activities at their school sites. Principals’ school-level perspectives became a “reality check” for MiC leadership teams’ district math visions and implementation plans. Although some districts included principals on their leadership teams from the beginning, and others never did, the entire CoP benefited from the principals who participated in the leadership teams.

Districts that included principals found their help vital in interpreting patterns of school

variation in student math achievement data. When anomalies in school data appeared, these principals were often able to provide information about allocation of resources at school sites, and about how those resources seemed to influence the dynamics of classroom instruction (and, thus, to influence student achievement). Principals were able to describe specific strengths or challenges at sites, such as strong grade-level professional learning communities, high teacher turnover, or intensive math coaching support. Using this information, the district leadership teams could explore the ways in which these strengths and challenges worked at other sites across the district. A more complete discussion of the importance of principals in supporting district implementation efforts is provided in our evaluation report *Developing Principals’ Instructional Leadership* (Perry & Reade, 2018).

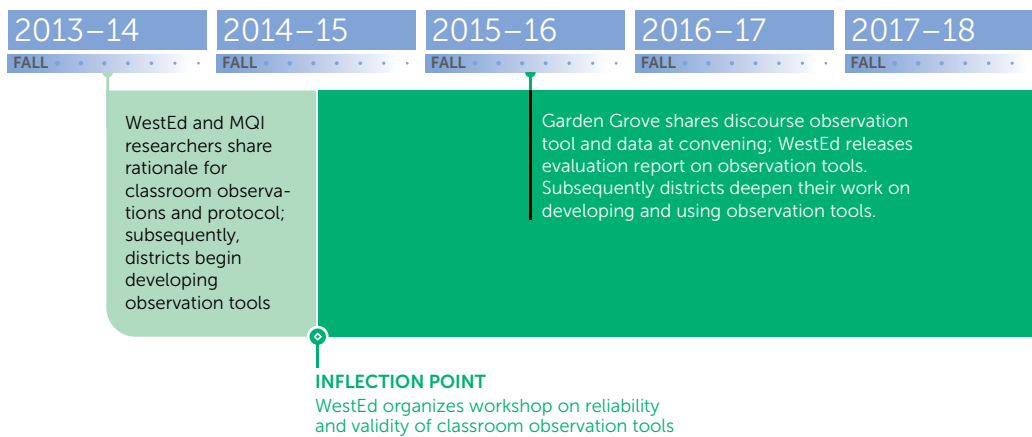
With this inflection point occurring in the 2016–17 school year, district MiC leadership teams began to reap some benefits from having “the right people in the room.” These teams were able to connect staff in different parts of their systems who might not otherwise have been working closely together, co-construct learning about improving math education, and reenvision their district’s shared work and learning. Conversely, we observed that district MiC leadership teams with less stable participation, teams in which the district lead had less decision-making

authority, and teams with less consistent involvement from principals encountered challenges in maintaining momentum and impact.

In many ways, these first four identified inflection points laid the foundation for the next three inflection points, which are grounded in the dynamics of classroom instruction and which thus provided detailed information about how districts were actually doing the work of implementing the math standards.

## Inflection point 5: Greater attention is given to developing classroom observation tools

*Seeded by early introductions to classroom observation rubrics and support for calibrating observations, in the later years of the initiative, districts developed and used observation tools for data collection and learning. As a result, district staff better understood the dynamics of classroom instruction and how district staff could better support teachers in achieving district goals.*



Developing and calibrating classroom observation tools proved to be an especially fruitful strand of work for both individual districts and the CoP as a whole. For most districts, several of the convenings and opt-in sessions from the 2015–16 school year demonstrated the value of developing, calibrating, and refining observation tools in order to focus on particular instructional elements in the classroom.

While observing classrooms was not new to any of the participants, the purpose of doing so changed. Rather than focusing on evaluating teachers’ coverage of particular content standards, districts focused their interest on understanding the extent to which teachers were implementing the instructional shifts required by the CCSS-M; this new purpose for observations demanded new tools.

It is rare that districts have the luxury of resources to carry out the difficult and



time-intensive work of creating and calibrating an observation tool. But with MiC support, most of the participating districts eventually developed or adapted some kind of observation tool. Many focused on observing academic discourse (discussed as a separate inflection point in the following section) or on related discrete elements of classroom instruction. The work done by Garden Grove Unified School District, described in the text box *The View from the Field: Spring 2015 Convening*, exemplifies how one district approached the task of creating and using an observation tool.

Perhaps the strongest indicator of the benefits that districts found in working on observation tools was that in districts' spring 2018 end-of-convening reflections, when asked about the work that they intended to focus on in the next year, eight out of 10 districts said that they would continue to refine their observation tools and conduct observations. By that point in the initiative, most district participants felt that even though gathering observation data was difficult and time-intensive, it should be a firm priority in order to understand implementation success.

However, while district MiC leadership teams reported that they found benefits in learning about observation tool development, they still saw significant room for improvement in this area, even at the end of the initiative. We



**It's important to have someone in a decision-making role who has a big-picture view of the district. In addition, it's important to have someone who is strong in the specific [site-level] content and stays up to date." — Sanger final reflection brochure**

observed that a few of the districts developed observation tools without thinking through the details of how to use the tool, and the resulting observation data, for improvement efforts. Other districts struggled to use the newly developed observation tools widely enough across their districts to gather meaningful implementation information from diverse schools, to understand implementation at scale. (Other reports in this series describe some of the approaches that MiC districts took to using observation tools — see, e.g., Perry, Marple, & Reade, 2019b).

## The View from the Field

### Spring 2015 Convening: Observing and Monitoring Students' Mathematical Discussion

With support from educators outside the district, Garden Grove Unified School District was able to develop an observation instrument that it used to examine students' classroom discourse experiences, to gather data on the prevalence of discourse opportunities, and to focus subsequent improvement initiatives. Through the early phases of using this tool, district staff quickly learned that the data they collected were only as useful as their tool was precise. Over the five-year MiC initiative, they iterated and improved their discourse observation tool more than a dozen times, as they realized that they needed to capture different kinds of data in order to answer specific questions about classroom teaching and learning.

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Using the observation tool, Garden Grove leaders also learned that teachers were not fostering mathematical discourse in the ways that the CCSS-M demand. To address this challenge one step at a time, district leaders recruited a small cohort of teachers to engage in a “discourse collaborative.” The cohort used the observation tool and readings about discourse to develop instructional strategies to support student academic discourse in mathematics.

Drawing on these experiences, district leaders from Garden Grove led an MiC convening activity focusing on observing and promoting student discourse. To begin the activity, MiC leadership teams from all 10 districts rated classroom transcripts of student discussion on a five-level mathematical discourse quality rubric. Using evidence from the transcripts, teams discussed and clarified their ratings and understandings about student discourse. Garden Grove leaders also shared data gathered using the district’s observation tool, and described the formation of the discourse collaborative.

Garden Grove continues to convene cohorts for the discourse collaborative, and principals have been tasked with using the observation tool as a way to support their own learning and feedback to teachers. Two other MiC districts have begun similar activities with small groups of teachers.

## Inflection point 6: The community of practice identifies *academic discourse* as a common area of focus

*Seeded by the new demands of the CCSS-M and by Garden Grove’s early learnings on academic discourse, MiC district leadership teams decided to focus the CoP’s collective attention on academic discourse. As a result, academic discourse became an anchor for numerous collaborative activities and provided common ground for districts to work together.*



### INFLECTION POINT

Ed Partners organizes first district coordinator meeting outside of convening, with academic discourse chosen as common focus; Garden Grove shares discourse observation tool and data at convening

CoP convenings during the initiative’s early years were packed with information, expert speakers, community-building activities, and cross-district sharing protocols. In an effort to provide as much information as possible, teams were transitioned from one activity to the next at a quick pace. This setup did not

allow sufficient time for participants to engage deeply in cross-district conversations to fully understand what implementation looked like in other districts. As a result, participants were exposed to thinking about the breadth of issues related to CCSS-M implementation, but could have been better supported to think





more deeply about particular thorny topics, such as formative assessment.

After two years of community building, members of the leadership teams were eager to find a place to dig in together on a specific element of the dynamics of classroom instruction. Prompted by the demands of the CCSS-M (see the sidebar *Why Academic Discourse?*), many districts' applications indicated a strong interest in academic discourse. Garden Grove's early learnings on academic discourse (see the text box *The View from the Field: Spring 2015 Convening*) played an important role in helping the CoP to ground its cross-district collaboration in this rich element of CCSS-M-aligned practice.

Shifting classroom instruction to align with the standards requires changing the ways that teachers think about and enact a multitude of instructional choices. Student discourse is just one of these instructional choices. But it is a particularly rich one, and thinking about why discourse is important, what it should look and sound like, and how to support teachers and students in the discourse process demands that administrators "get real" about understanding exactly what is happening in classrooms and how they want it to be different. With this in mind, each district MiC leadership team and participant needed to specify their own discourse priorities for students, identify strategies that they were undertaking to support teachers and principals in implementing this instructional goal, and consider how to measure both teachers' instructional shifts and students' successes.

The work of promoting student discourse in the classroom was made richer by the nature of academic discourse as a goal. Equitable and frequent talking in math class is an important start, but is not sufficient in itself. Having students engage in academic discourse requires that educators define what they want to hear students saying or writing about mathematics. For that discourse to be truly academic in nature, students need support in order to respond to and challenge one

#### WHY ACADEMIC DISCOURSE?

The CCSS-M encourage students to engage in effective academic discourse in order to improve their overall mathematics achievement, which is not a new idea (see e.g., Hufferd-Ackles, Fuson, & Sherin, 2004; Bransford, Brown, & Cocking, 2000; National Mathematics Advisory Panel, 2008). New in the CCSS-M is the centrality of discourse as one of the eight Standards for Mathematical Practice: SMP 3. Specifically, SMP 3 is about students "construct[ing] viable arguments and critique[ing] the reasoning of others." Ellen Whitesides, former Director of the Common Core State Standards Projects, noted that achieving this standard requires teachers and students to be able to break complex mathematical practices down into component parts (McCallum, n.d.). To engage in academic discourse, students need explicit instruction on how to "use assumptions, definitions, and previous results," "recognize and use counter examples," "justify conclusions," "respond to arguments," etc. For many educators, SMP 3 underscores that students need to have more than just a procedural understanding of mathematics in order to master the CCSS-M; it ups the ante for what districts need to help teachers and students do in order for the standards to be successfully and equitably implemented.

another's ideas, and to develop metacognitive stances about their own ideas. To provide this support, teachers must learn how to shift the intellectual work of learning onto students (see the sidebar *Why Academic Discourse?*). In short, achieving academic discourse in diverse classrooms is a significant shift from how much prior U.S. mathematics instruction occurred; it also differs from some of the MiC districts' approaches to instruction, which followed an Explicit Direct Instruction model.

By taking time to compare and contrast their definitions and district-specific efforts around academic discourse, district participants could compare how peers worked toward similar goals and measured their progress (see the text box on page 22 *The View from the Field: How Oceanside Brought Focus to Academic Discourse in Mathematics* for an example of one MiC district's work in this area). Thus, discussions could be focused on best practices related to teacher or principal professional development or on specific data-collection tools and rubrics related to academic discourse.





## The View from the Field

### How Oceanside Brought Focus to Academic Discourse in Mathematics

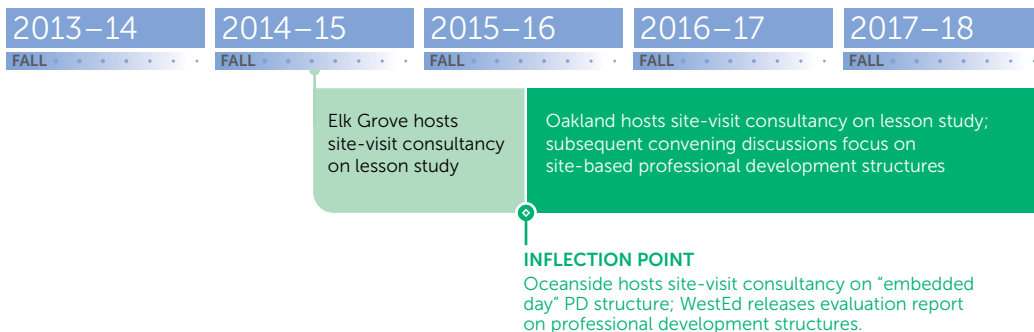
Oceanside Unified School District's MiC grant reports between 2014 and 2017 show that, in each year after 2015, student academic discourse became an increasingly important emphasis of the district's math improvement work. Oceanside's vision focused on academic discourse: "All students will demonstrate their thinking both verbally and in writing to show understanding of their learning." This vision guided a variety of district initiatives, brought coherence to the district's work, and may have influenced student achievement (Perry & Huang, 2019). Oceanside's coherent approach to tackling academic discourse involved providing professional development for educators at multiple system levels:

- K–8 math professional learning for teachers and principals, organized around student academic discourse
- District-supported attendance for teachers at summer professional learning with the Silicon Valley Math Initiative, on topics such as student "reengagement lessons" and the TRU rubric
- Site-based professional development, supported by math specialists, structured around cycles of inquiry examining student discourse
- Design, testing, and revision of a classroom observation tool to capture data related to the quality of student discourse over time (the tool was used to facilitate conversations with teachers and principals related to discourse and to more carefully calibrate ideas about discourse across multiple district stakeholder groups)
- Administrator support, through monthly principal trainings and classroom walk-throughs, to learn how to support academic discourse
- Launch of a small improvement project to advance principal-to-teacher feedback, to promote frequent, high-quality student discourse (carried out by a subset of MiC leadership team members, in partnership with WestEd)
- A goal of using technology to increase the frequency and quality of student discourse (e.g., using the digital tool Seesaw)



## Inflection point 7: The community of practice identifies *professional development structures* as a common area of focus

*Seeded by a growing sense that site-based support was effective for teacher professional development, MiC districts developed a shared interest in honing similar site-based professional development offerings. As a result, districts shared ideas and were able to design more productive professional learning opportunities for their staff.*



Districts built greater clarity about professional development through using the CoP to showcase and share specifics about their professional development activities. *The View from the Field: How Oceanside Brought Focus to Academic Discourse in Mathematics* provides an example of how, once a focus is chosen, many professional development structures can be brought into alignment to amplify the learning needed in order to reach intended goals. Most districts reported using various types of these structures early in the initiative as part of their systems-change process. A separate report in this series is devoted to the topic of professional development (Perry, Marple, & Reade, 2019b).

In the CoP, districts shared strategies about how and why they used external professional development support providers,<sup>3</sup> and even how to find time for teacher professional development. Districts learned from one another what seemed to be working well (e.g., different structures to support teachers’ learning using cycles of inquiry) and how professional development worked in specific district contexts. These discussions, made possible by the experiences and expertise that districts shared with one another in the initial years of the initiative (for example, Oakland sharing its method for implementing lesson study, as described in the text box *The View from the Field: Winter 2016 Site-Visit Consultancy*), were some of the most productive conversations in the CoP, reflected in subsequent actions taken by districts.

<sup>3</sup> Solution Tree, the Silicon Valley Math Initiative, and the Irvine Math Project all expanded their work through the MiC connections.

# Conclusion and Recommendations

While there is significant literature about the promise and potential of CoPs and networked improvement communities, there are few examples of how the work of these CoPs plays out in the context of school districts meeting the real challenges of educational improvement. MiC was a pioneering initiative in its use of a CoP that brought together districts from across California to support each other as they implemented the CCSS-M.

The community that was built by the CoP early in the initiative created a foundation of trust, which enabled types of sharing and collaborative work that are rarely seen among cross-district teams. Additionally, variation among the district MiC leadership teams participating in the CoP — in terms of the districts' demographic contexts and improvement foci as well as individual team members' backgrounds and experiences — created both opportunities and challenges. While diversity among participating individuals and districts contributed to a great variety of ideas and information within the CoP, it quickly became apparent that the districts' unique cultures and nomenclatures could cause confusion.

The inflection points identified in this report suggest that the work of the CoP started to cohere and accelerate as the CoP developed more targeted foci: classroom observation tools, academic discourse, and professional

development structures. These foci enabled participants within and across districts to begin to speak to one another in consistent ways about improving the dynamics of classroom instruction. We wonder whether the CoP could have benefited from moving more quickly into examining the nuts-and-bolts processes of CCSS-M implementation during its first years, using some of the tools that it later employed. For example, we wonder whether using a rubric focused on narrower categories of math improvement, or on the dynamics of classroom instruction, earlier in the initiative could have resulted in data that teams could have used to develop clearer theories of how changes were to be accomplished.

The following list provides four recommendations for future communities of practice, based on some of our observations and learnings from the evolution of the MiC CoP:

- **Recommendation 1: Focus on making incremental changes in order to reach the ultimate goal.** Improving student achievement in mathematics involves transformation in all aspects of complex district systems. But achieving such improvement cannot be done in a single step; it will require a clear theory of improvement and small steps along the way toward that improvement. With consistent energy devoted to incrementally reviewing, testing, and maybe even changing such theories over time, it may be possible to fundamentally transform district systems.
- **Recommendation 2: Identify key areas of focus.** It is impossible for



complex change efforts to focus on all aspects of change simultaneously. Future CoPs may find value in spending significant time, early on in a change initiative, to understand the systems that participants are hoping to change. From there, the CoP can select one high-leverage aspect, or a few high-leverage aspects, of those systems as a shared goal to learn about and work toward together.

- **Recommendation 3: Use diverse expertise to understand common focus areas.** Developing an effective CoP is difficult because its effectiveness is dependent on individual and organizational learning and change, and because all participants have different expertise and experiences. When the diverse group of MiC CoP participants focused its joint attention on a few shared problems of practice, all of the participants were able to learn more deeply by comparing and contrasting their work on these issues within and across districts. Evaluators, or others serving in a similar

questioning role, can help district educators to be reflective about how their theory of improvement connects with their programs, policies, and practices.

- **Recommendation 4: Employ multiple forms of data to assess improvement.** Although data was intended to be an important part of the district MiC leadership teams' annual improvement cycles, the early forms of data that were available to the teams did not adequately support improvement. Future CoPs that are focused on districtwide systemic changes may want to employ the different types of practical measures that improvement scientists recommend attending to, such as process measures that help assess how well parts of a system are functioning to achieve specified aims (Bryk et al., 2015). Support should be offered to help practitioners incorporate data inquiry more regularly into their district routines and practices, to support ongoing data-informed improvement.

# Postscript

We noted a telling, and touching, moment when, at the spring 2018 MiC CoP leadership convening, participants gathered in a large circle to talk about what the past five years of work together had meant to them. Responses were unique, mirroring the diversity of the gathered group, but several common themes surfaced, including “best professional development of my life,” “like a family,” “hard work . . . for the kids,” and “valued my input.” Participants lauded their peers from other MiC school districts for providing valuable input into their learning. Emotions ran the gamut from tears to laughter, and almost all participants contributed a reflective comment.

The responses of the CoP participants are significant because they demonstrate that something deeply meaningful had

happened over the years for many individual participants, who are now well positioned to capitalize on their learning from the initiative. While initiative funding to districts ended in June 2018, the Foundation provided two additional years of evaluation and convening funding for the CoP. Eight out of the 10 districts will continue participating in the CoP — a clear indicator of the benefits that it has provided. As they continue to work to support standards implementation, CoP participants will keep their meaningful learning with them as they move forward in their roles or move to new roles or districts. It remains to be seen where the initiative’s impact will be greatest: At the individual level, as a result of professional learning received? At the district level, in the establishment of durable structures for math improvement? In improvement in CAASPP scores? Or will the impact depend on the contexts and characteristics of the individuals and districts that participated?

We believe that, in many ways, only time will show the cumulative impact of these five years of work. It is our hope that over the next two years, more of that impact will be revealed and whatever impacts there are will be described in our forthcoming reports.

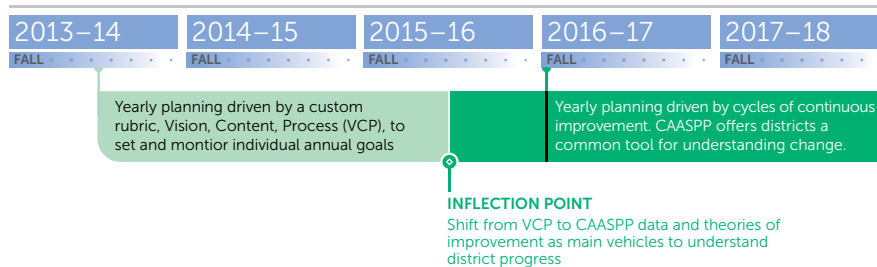


# Appendix A. Seven MiC Inflection Points

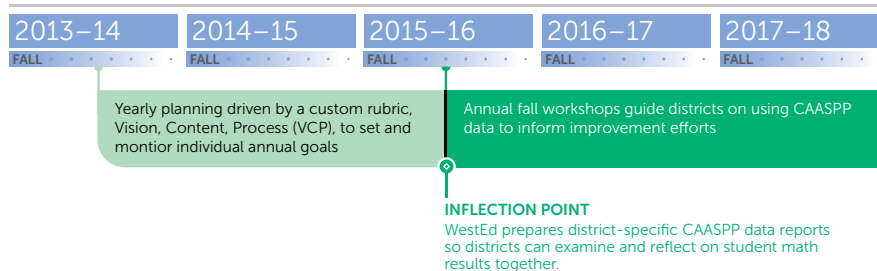
The following figure presents the seven inflection points at which the Math in Common community of practice's work started to display greater cohesion and shared focus, which catalyzed teams to move further and go deeper in their CCSS-M implementation efforts.

**Figure A1. Seven MiC Inflection Points**

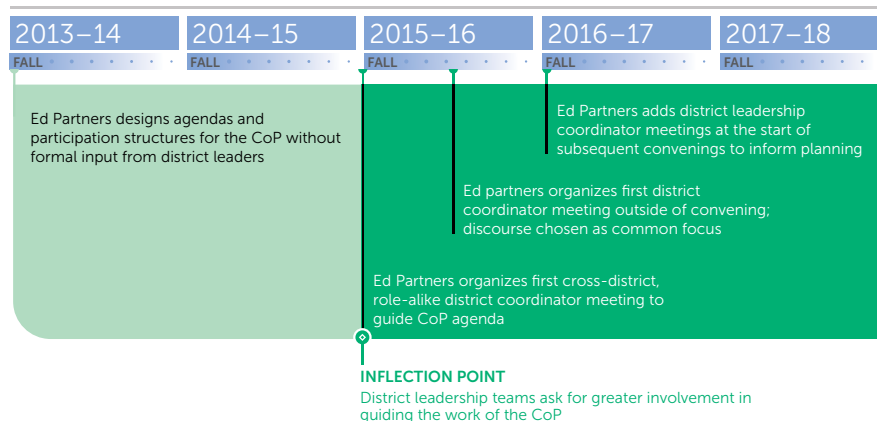
Annual planning and goal setting process is strengthened and clarified by being tied more closely to theories of action and a shared data set



New analyses of CAASPP data allow network to discuss investments and results with greater specificity

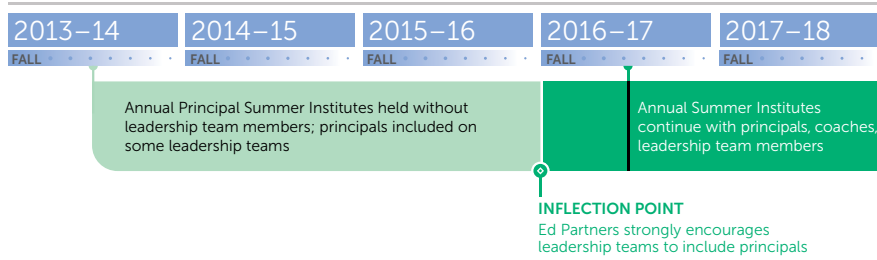


Ed Partners invites district leaders to take more ownership over the network's direction

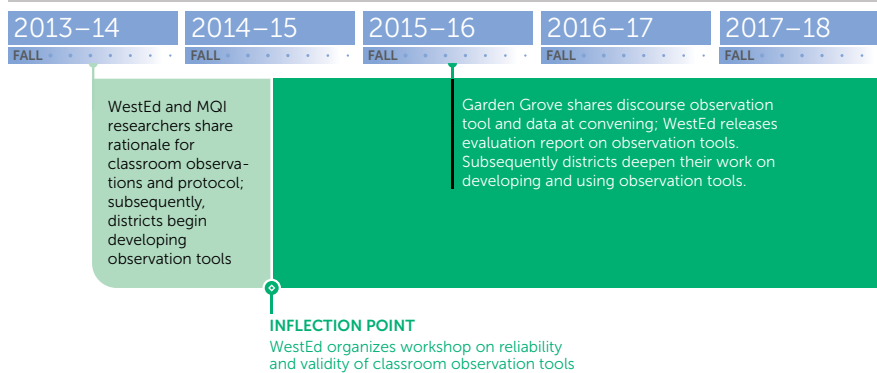


**Figure A1. Seven MiC Inflection Points (continued)**

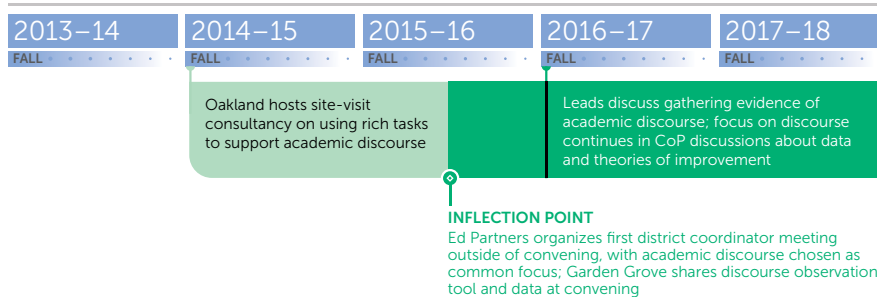
Principals are more widely integrated into the community of practice



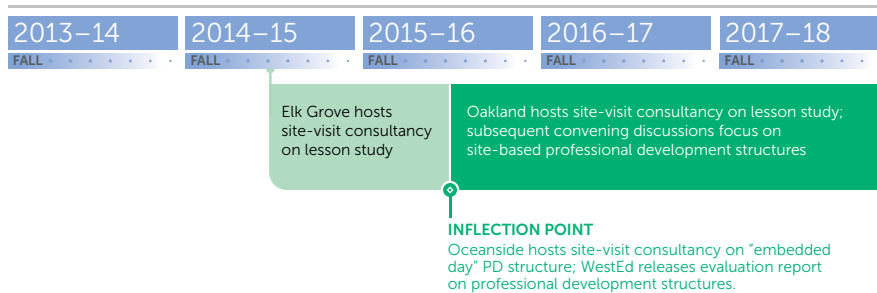
Thoughtfully designed observation tools become a key focus for understanding and sharing implementation progress



After years of exploring multiple instructional topics, network narrows shared focus to academic discourse



Districts converge on site-based professional development as a key area of common work and learning





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