

## Practices Worthy of Attention

# Building Teacher Capacity

As all readers will acknowledge, there is continual innovation in education. Our goal with *Practices Worthy of Attention* was to document what is really happening in the field to strengthen secondary mathematics around the country. The practices we highlight may be common, but the specific structures and strategies used to implement them are worthy of attention. As we examined the schools, districts, and programs in this study, we found innovation in two categories:

- their approaches to raising student achievement and improving student learning in mathematics, and
- their approaches to increasing teacher capacity.

This document describes strategies and practices for increasing teachers' knowledge and skills. District and school practices for raising student achievement and improving student learning in mathematics are discussed in a companion to this piece, *Raising Student Achievement Through Academic Intensification*.

Research indicates that secondary mathematics teachers vary in their knowledge of the mathematics content they are expected to teach (Barth & Haycock, 2004; Massell, 1998). Moreover, teachers interpret the same instructional ideas in various ways (Marzano, 2003; Stigler & Hiebert, 1998, 1999), which results in inconsistencies in instruction across classrooms within the same district and even within the same school. To address this problem, school districts are pouring enormous quantities of resources into their secondary mathematics programs to improve teachers' capacity to deliver a consistent and rigorous high school curriculum—aligned with state standards and assessments—that prepares students for success in college and entry into high-quality workplaces. Yet despite these substantial investments, district and school reform efforts vary greatly in quality and usefulness for successfully building teacher capacity.

All of the schools, districts, and programs profiled in this study have increased their expectations for what teachers should do, but some of them have focused intense attention on improving teacher practices. The practices described in this document provide opportunities for teachers to expand their practices through focused interaction with other teachers and through accessing resources with individual support. The practices require support from administrators to overcome traditional ways teachers have interacted. As teachers are asked to teach students who have various experiences and backgrounds, districts and schools are asked to support teachers the same way instead of providing all teachers the same training regardless of their need.

This document describes three main approaches that emerged from our observations: redefining mathematics teacher roles and responsibilities, making instruction public, and having new, customizable tools for teaching.

## Redefining Mathematics Teacher Roles and Responsibilities

Four of the districts in this study identified different areas on which to focus but came to the same type of solution: broadening the sphere of mathematics teachers' roles and responsibilities. In New York City and Denver Public Schools, mathematics teachers work closely with teachers who specialize in teaching students with special needs, learning how to maintain rigorous content standards while supporting students learning English or students in special education. In Portland Public Schools and Lamoille South Supervisory Union, mathematics teachers are taking on leadership roles and working with district leaders to learn more about specific district mathematics needs. In the Partnership for High Achievement, district leaders and teachers are working together on developing goals and supporting classroom development.

**Improving Teaching for Specific Subpopulations:** The practices in Denver and New York City encourage good teaching by focusing on the types of instructional tasks that teachers can use for differentiating instruction to meet the diverse needs of students, encouraging the use of academic vocabulary, and providing various entry points for students to learn the mathematical concepts. These practices also provide teachers with feedback on specific ways that some students may struggle as a result of language acquisition issues or cognitive impairment.

- **Denver Public Schools** (Denver, Colorado) developed a collaboration between mathematics and special education teachers. The district believes that special education teachers often do not have expertise in mathematics and thus have difficulty supporting their students in mathematics at higher grade levels. Mathematics teachers do not always know how to accommodate special education students' individualized education plans without "dumbing down" the mathematics content. Denver saw a need to broaden teachers' roles by having mathematics and special education teachers work together to best support all of their students in secondary mathematics.

In Denver's program, teachers are matched in pairs (one special education teacher and one mathematics teacher) for the academic year. The whole group meets about every six weeks. In each meeting, each pair of teachers writes a single mathematics lesson plan, working together to build in accessibility and accommodations to address the range of their students' individual challenges and needs. The goal is for teachers to maintain the integrity of the mathematics while also following a process for planning accessibility strategies that address learning barriers. To make their work concrete, the teachers each choose three students who represent a range of mathematical abilities and write their lessons with those students in mind. Built into each meeting are opportunities for teachers to reflect on their use of specific strategies and share their goals and cautions regarding accessibility strategies. This type of sharing builds a supportive group that shares ideas and actual practices in the field, giving the teachers a common set of goals to aim for and cautions to keep in mind.

- **New York City Department of Education** (New York City, New York) created the English Language Learners (ELL) Mathematics Initiative to raise the academic achievement of ELL students through a strong network of district and school-based

mathematics and ELL leaders. The initiative is designed to raise the quality of mathematics instruction while providing for the diverse needs of students with various language and academic backgrounds.

At the core of the initiative is a professional development program for mathematics teachers that emphasizes techniques specifically geared to students whose first language is not English. Since NYC believes that mathematics is not “language-neutral”—meaning that math pedagogy depends on the language of instruction—the professional development opportunities focus on how teachers must teach in ways that incorporate students’ native languages, English, and academic mathematics language.

Teachers are trained in WestEd’s Quality Teaching for English Learners (QTEL), which helps them develop a theoretical foundation and corresponding strategies for effectively teaching academic language to ELL students. The tools and processes taught in professional development modules focus on developing adolescent students’ abilities to read, write, and discuss academic texts in English. Reflection activities for teachers provide opportunities to think about past lessons and plan how to address specific challenges. Teachers also analyze case studies and videos that show a range of teaching styles, in order to better understand some obstacles to their own as well as their students’ understanding. Additionally, teachers are asked to develop resources and lesson plans and to problem solve specific teaching and learning situations.

Through the QTEL program, a twice-yearly conference, and action planning meetings, mathematics and ELL teachers stay engaged in ongoing discussions about improving mathematics learning for ELL students and refine their practices throughout the year.

**District Roles and Responsibilities:** In both Lamoille South Supervisory Union and Portland Public Schools, teachers are asked to involve themselves in district-level activities. Teachers are expanding their roles and responsibilities beyond the classroom, which in turn improves the way they think about their own practices. In the Partnership for High Achievement, district leaders and teachers work to communicate and sustain common goals with concrete steps for improving classroom practices.

- **Lamoille South Supervisory Union** (Morrisville, Vermont) consists of three school districts serving students in grades K–12. LSSU is creating a local, balanced assessment system in mathematics that is aligned with the K–12 curriculum. To support that work, teachers’ responsibilities now include developing assessments at the district level. Teachers receive training in assessment development and concepts of “assessment for learning,” which helps them understand how assessment can provide the information they need to improve their practices.

LSSU incorporates the use of ongoing and embedded professional development structures that broaden teachers’ knowledge and understanding of the development, use, and analysis of assessment. LSSU leaders involve teachers in writing assessment items because they believe that, to affect instruction at the classroom level, teachers need to understand what is expected at the district level. They also believe that

teachers need to be involved in the kinds of conversations that help them reflect on their practice.

As they develop assessment items, teachers talk about different types and uses of assessments (formative, benchmark, and summative), learning how to make judgments about student learning depending on the type of student work or data they have available. In addition, given that teachers use the same assessments, they can collaborate to analyze the results and then plan interventions and modifications together.

- **Portland Public Schools** (Portland, Oregon) has developed a set of district-level leadership opportunities for all interested mathematics teachers. The district mathematics specialists believe that developing local leaders at each school as agents of change is the most effective way to sustain a common set of mathematics goals across the district. They hope that this will increase teacher capacity at each school and lead to better and more consistent mathematics teaching so that students have equal opportunities for mathematics achievement.

The leadership opportunities are organized within a large group of teachers and district mathematics specialists. Each year, the large group divides into subgroups focused on different ways of approaching mathematics education improvement. For example, one year three different subgroups focused on determining the content for a new third year of high school mathematics graduation requirement, supporting the transition of students from eighth grade to high school math, and developing and piloting districtwide common formative assessments in grades 6–8. The next year, the two subgroups working on third-year math and the eighth-grade transition to high school remained, and two new subgroups formed, one focused on implementing the College Preparatory Mathematics program and the other on using technology in mathematics classrooms. The subgroups change shape as the responsibilities and needs of teachers change

The subgroups generate guidelines for interaction to support individual voices and develop a clear set of steps to meet goals. Teachers volunteer to facilitate monthly meetings, and the district math specialists help them plan the agendas. In their teacher–leader roles, teachers feel they have the power to make a difference beyond their classroom, and leading and participating in these district-level groups is a way for them to be directly involved in district improvement in student mathematics learning.

- The Partnership for High Achievement (PHA) is a Dana Center program designed to strengthen the capacity of leaders and teachers to implement a research-based instructional support model to continuously improve teaching and learning. The model integrates leadership development for department, school, and district leaders with support for classroom teacher development.

PHA’s strategy is to provide technical assistance and professional development to a district’s teachers and leaders to support the district in ensuring that every student has

access to the same curriculum. To implement this strategy, a leadership advisor works with the district leadership team, and a mathematics advisor works with designated teacher teams. The advisors teach district leaders and teachers about the instructional support model and how to implement it, and provide supplementary resources based on the unique needs of the district. The advisors work with the district leadership team and teacher teams throughout the school year to ensure that the elements of the instructional support model are accomplished.

In all four districts, the broadened teacher roles and responsibilities promise to increase teacher skill sets and renew investment in student learning. Certainly, the teachers seem to be embracing their new roles. In Denver, reflective feedback collected from the participating teachers indicates that they are learning more about content and improving their teaching strategies. New York City teachers appear receptive to improving their practice to accommodate ELL students. In LSSU, teachers are having epiphanies about the role of assessment for learning and are eagerly engaging with one another and their students. In Portland Public Schools, 36% of secondary mathematics teachers are involved in a mathematics leadership subgroup. In PHA, participating districts' mathematics and science scores have gone from below the Texas average to above the Texas average.

## Making Instruction Public

Deprivatizing instruction, or making instruction public, is a powerful means for changing teacher practice. This requires teachers to open up their classrooms, trusting that observers are not evaluating them but are providing valuable feedback to help them reflect on their practices. Making instruction public allows teaching and learning to be captured in multiple ways from multiple sources, giving teachers regular feedback so they can continually work on improving their teaching. Three districts and one multi-district initiative have made open classrooms a major part of their mathematics improvement plans. Bellevue School District provides common lessons and assessments for its teachers and requires teachers to post all assessment data on the district's intranet. Columbus Public Schools has teachers observe each other with a structured observation protocol and provide feedback in weekly professional learning communities. YES College Preparatory School has a teacher feedback and evaluation system that provides feedback through structured observations by peers, supervisors, and coaches throughout the school year. Phoenix Union High School District standardized the goals and strategies of teaching and learning through Algebra I professional learning communities. The Silicon Valley Mathematics Initiative uses a coaching model that has coaches working frequently with teachers on their practices.

- **Bellevue School District** (Bellevue, Washington) has a goal of “getting rid of walls of classrooms” and building a culture of openness and sharing among teachers and the district mathematics curriculum coaches.

The curriculum coaches observed classrooms, learned what teachers were doing successfully, shared the successful practices with all mathematics teachers, and helped teachers with their concerns and challenges. Though some teachers were defensive at first, feeling that observations were a threat to their autonomy, they soon saw the value

in sharing their successful practices, especially when they were working together toward the same goals.

Bellevue further encourages teacher collaboration by sharing the results of common assessments so teachers can see how all students are performing on the same types of tasks and discuss how their practices contributed to their students' performance. The district develops common assessments for every unit at every grade level, and teachers are required to administer the assessments, score students' work, and post results on the district's intranet. With assessment results accessible to the entire professional community in Bellevue, the hope is that teachers will seek out and share best practices with each other in the ongoing effort to improve work with students.

Further, the operations and results of teacher practices are available to greater numbers of people, including parents, because the district requires all teachers to have a classroom website that includes the course syllabus and/or grade-level goals and expectations. The website also includes online access to grades.

- **Columbus Public Schools** (Columbus, Ohio) has made classrooms public through peer observations of teachers. At each school, a teacher leader, who is trained at the district level on supporting professional learning communities, conducts weekly meetings to help other teachers work as a team to address issues with which they are struggling. Most of the time in these meetings is spent developing specific strategies for addressing student needs, but the work also involves reviewing progress on school-specific action plans, student testing results, and teacher–student survey results. These meetings have helped encourage teachers to stop working in isolation and to open their classrooms and their practices to observation.

Teacher leaders have developed and refined a data collection tool they use in observing classrooms and collecting information about instructional strategies. The teacher leaders use the data they collect to promote discussions with teachers about how to learn from these observation experiences; the culture surrounding these discussions is collaborative, not evaluative.

Principals observe classrooms to see if there is systematic use of the standards-based mathematics curriculum guides. Most principals do classroom walkthroughs daily, as required by the district. The principals have been trained to ask reflective questions of teachers and have also learned how to focus on what they should be seeing in mathematics classrooms. District-level administrators also visit classrooms, and several mathematics curriculum specialists spend at least a half-day per week visiting schools and monitoring the implementation of the mathematics curriculum.

- **YES College Preparatory School** (Houston, Texas) has embedded into the teaching culture a teacher feedback and evaluation system that includes regular observations by coaches, mentors, peers, and supervisors. This system supports teachers with goal setting and reflection, providing feedback to improve teacher practices throughout the school year as part of their ongoing professional development.

At the beginning of the year, teachers set goals, using a summative rubric as a guide. The rubric covers four domains: classroom management and culture, instructional planning and delivery, YES responsibilities, and YES values. Each domain has multiple indicators, so observers can rate teachers on each indicator during their observations to come up with a composite domain rating. This detailed rubric helps observers identify the areas in which teachers need the most help and support, which enables them to customize mentoring and coaching in the feedback to help improve teacher pedagogy.

Throughout the year, teachers receive feedback from their peers, from supervisors, and from students. At the end of the school year, the summative rubric, along with their course material, progress on professional development goals, self-reflections, self-evaluations, administrator evaluations, student performance, and student feedback, is used to evaluate the teacher's performance.

- **Phoenix Union High School District** uses professional learning communities to create a culture that focuses on how to change the way teachers engage with students. Teachers in Phoenix Union began to work together to change the culture of practice by opening their doors to peer review and learning from one another about best strategies for improving student learning in mathematics.

When teachers opened their doors to each other, no teacher worked in isolation. Teachers began to share what worked well and went to one another for help when they struggled with a concept or topic. They make all student work public so they can analyze what students really know and what they are struggling with. Teachers began to change their thinking about classroom observers, no longer assuming they were evaluative and critical; instead, teachers learned ways of improving their practice through observation of their peers. These changes resulted in more consistent instruction and assessment strategies across the district.

The district also asks teachers to work in teams to provide meaningful lessons and assessments that are congruent with the curriculum. Although methods for building lessons and assessments are discussed in teacher preservice and inservice workshops, the teams allow teachers to help each other better understand the development process as they look at specific instructional examples, resources, and strategies. By developing and working with common lessons and assessments, teachers can learn from one another and have more consistent methods of delivering instruction.

- **Silicon Valley Mathematics Initiative (SVMI)** believes that the key to improving student achievement is improving instruction through intensive hands-on professional development for individual teachers. To that end, the initiative has mathematics coaches frequently observe classrooms and discuss their observations with teachers one-on-one. This practice makes teachers' instruction open to outside feedback while providing a structure for teachers to learn how to improve their instruction.

The main job of the coaches is to help the teachers they work with to focus on student thinking and mathematical pedagogy. Coaches visit the classrooms of each of their

teachers about 20 times per year. The general structure of each visit includes a pre-conference, observation of a lesson, and a post-conference. Coaches encourage teachers to reflect on the lesson, examining student thinking and work as evidence, to help inform and adjust future instruction.

The mathematics coaches tend to relate to their teachers in one of three ways—as collaborators, models, or leaders. In the collaborator role, coaches are a resource to the teacher, providing materials, information, and encouragement, and collaborating with the teacher to plan lessons. In this role, coaches do not give direct feedback about the teacher’s pedagogy, but focus more on student work, which makes the teacher feel less defensive about being evaluated or criticized. In the model role, coaches model instruction of deep problem-solving tasks for students. Teachers can use this model lesson as a guide for developing their future lesson plans. As a leader, the coach guides the teacher in nonevaluative ways. For instance, the coach’s comments are grounded in what was just observed—what the teacher understood about how well the lesson went and what students seemed to learn. The coach then helps the teacher figure out how to address the content the students did not seem to understand well.

These strategies for making instruction public are helping teachers better understand their own practices and improve their teaching. Teachers in the districts described have found that deprivatized instruction encourages collaboration and allows them to support each other. In Bellevue, teachers are much more comfortable now sharing their information with each other and with parents. In Columbus, teachers indicated that the weekly meetings were useful for establishing collaboration and consistency of instruction, and they are now accustomed to regular visitors in their classrooms. At YES, all teachers are meeting a minimum standard for providing quality teaching to their students. In Phoenix Union, teachers have an open-door policy where they consistently observe and learn from another. Teachers involved in SVMII coaching are using evidence of what students have learned rather than anecdotal information to gauge students’ understanding.

## New Tools for Teaching

An issue in training teachers in the use of new tools and resources is that professional development is usually the same for all teachers in a given school or field. Teachers meet for workshops to receive training on specific resources or pedagogical techniques. However, the success of such strategies and tools differs significantly in different cases, since teachers come into the workshops with different knowledge, experiences, and pedagogical practices. To remedy this problem, one program and three districts we studied provide customizable trainings to help teachers appropriate new tools and strategies to improve their teaching practices.

- **Agile Mind** is an online tool that supports and models sustainable teaching in a host of secondary mathematics courses (from middle school mathematics through AP Calculus).<sup>1</sup> Curricula are aligned to state standards in the states in which Agile Mind is

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<sup>1</sup> Agile Mind is a commercial partner of the Charles A. Dana Center. The Dana Center developed the *Practices Worthy of Attention* profiles.

used, to the National Council for Teachers of Mathematics (NCTM) standards, and to various mathematics textbooks so that teachers can use Agile Mind to support the textbooks they are required to use.

Instructional resources are available for teachers to use in planning and delivering instruction and effective assessment. Each “course” in the Agile Mind service—such as Algebra I—includes several “topics”—such as Algebra I linear representations. Within each topic, an online instructional guidance system provides teachers with specific resources for instruction planning, teaching, assessment, addressing various teaching challenges, and alignment to state standards and textbooks. Teachers can use all of this resources or select specific ones. Within each online resource, teachers have the option of adding their own notes, which helps them customize their practice.

Agile Mind provides instructional guidance for all aspects of the lesson, from opening questions that enable teachers to introduce key concepts and engage students in discussion to framing questions that support teachers in helping students apply the lesson to real life. Further questions are suggested to help probe students’ thinking and to uncover misconceptions. Teaching tips offer strategies for dealing with possible challenges students may face. Assessments are built into each topic, with different types of reports available so teachers can review both what the entire class understands and what individual students understand. Agile Mind offers teachers a range of resources they can use in secondary mathematics courses, giving them the flexibility to choose the best resources for their instructional goals.

- **Anchorage School District** (Anchorage, Alaska) developed their own Assessment Reporting System, a comprehensive database system that follows students longitudinally with all the data that was previously kept in their paper cumulative folders. The purpose of this system is to give teachers access to data on their students at any time. For instance, if a student transfers to another teacher or school within Anchorage, that student’s data are immediately transferred electronically into the new classroom, so teachers have up-to-date access to all the student information they need.

Data are available for individual student performance on district and state assessments across several years. While teachers can view their own classroom data, school administrators can view an entire school or any classroom within their assigned school. The system allows the district to customize professional development opportunities to the needs of individual teachers and schools. District-level mathematics curriculum specialists work with individual teachers and schools that have lower than average performance in the district.

The Assessment Reporting System allows users to sort students by demographic information like race/ethnicity or sex based on proficiency on various mathematics assessments, by the entire assessment or by mathematical strands. The four proficiency levels are color-coded to give teachers a visual snapshot of where students need the most help, allowing them to target specific students struggling in each strand. The format of all data output has been customized based on teachers’ requests, and the reports continue to be revised in response to teacher feedback. Since the system is

homegrown, not an off-the-shelf product, Anchorage has the flexibility to further customize the system to improve its usefulness as a tool to inform teacher practices.

The Assessment Reporting System also features a grade-level expectation item bank. Teachers can pull items from this bank that are linked to the grade-level expectations they are focusing on and use those items to develop customized mini-assessments. The data from these items can then be used as part of the instructional cycle for measuring and improving student learning on different mathematics expectations.

- **Boston Public Schools'** (Boston, Massachusetts) secondary mathematics coaches have devised a new way of developing teacher capacity with an approach that the district calls asset-based instruction. Asset-based instruction encourages teachers to focus on each student's strengths rather than on their deficits. Coaches model the asset-based approach for teachers by highlighting instructional experiences that enhance teachers' understanding of and competence in teaching mathematics. This approach builds on teachers' strengths, helping them see how they can then use those same techniques in engaging their students. The asset-based approach allows teachers to customize their instruction and allows coaches to customize their approaches to teacher professional development. In addition, because coaching is at the individual teacher level, the coach can customize the training to emphasize what he or she believes a teacher needs to work on.

After observing a teacher's classroom, a coach talks with the teacher about student-centered coaching and the strategies teachers can use to take advantage of the known strengths of each student and the class as a whole. The coach usually focuses on the interaction of the teacher with a particular student to exemplify the techniques. The teacher and coach discuss the importance of both affective and cognitive experiences in helping motivate students, again from the perspective of building on students' strengths. They also talk about how to improve ability beliefs, which include students' self-confidence in and self-appraisal of their ability to engage in mathematics learning. Together, the teacher and coach also identify patterns of students' strengths by analyzing student work and using assessments. The coach reinforces how to motivate students with genuine positive support and encouragement as often as possible. The teacher and coach also identify places in the curriculum where students are currently successful and map out a lesson that guarantees at least one successful experience for each student.

- **Cleveland Municipal School District** (Cleveland, Ohio) is using a program called Keeping Learning on Track in its 10 lowest-performing K–8 schools. KLT is a formative assessment program developed by Educational Testing Service. The focus of KLT is on using evidence of learning to adjust and customize instruction while it is taking place so that teachers can immediately address students' learning needs.

Since teachers' instructional styles vary, KLT provides a variety of ways for teachers to measure student learning on the fly, which gives teachers flexibility to choose strategies that work best for them to make instructional adaptations right at that moment. Regardless of the techniques teachers decide to use, these types of formative

assessment checks can provide teachers the feedback they need to change their daily practice, and that small change may result in large changes in teacher pedagogy, the classroom culture, and student learning.

Teachers using KLT meet regularly to reinforce and build upon the techniques, strategies, and ideas behind the program. Teachers use these meetings to discuss the implementation of assessment-for-learning techniques in their classrooms and to refine their understanding of KLT techniques.

These four practices and tools show promise for improving teacher practices. Agile Mind users tend to increase the implementation of the Agile Mind resources each year they use it, and schools tend to expand the courses that can be supported by it. In Anchorage, teachers report that they appreciate the Assessment Reporting System and use it to analyze and understand how their instruction affects student performance. In Boston, teachers appreciate the individual coaching and modeling they receive and recognize how asset-based instruction changes the culture of their classrooms. In Cleveland, teachers report that they regularly use assessment for learning techniques; the schools using KLT have seen substantially greater gains in student achievement than have non-KLT schools, and the district believes that KLT is a large contributor to those gains.

## Conclusions

Building teacher capacity requires changes in district and school attitudes about how to best support teachers as they improve their teaching. The practices described here show how expanding teachers' roles, making mathematics teaching a public enterprise, and providing new teaching tools with customized training provide teachers with opportunities to improve their teaching.

With broadened roles and responsibilities, teachers redefine how they think of teaching and what they can contribute. They learn that they can gain expertise for successfully working with subpopulations of students in need of help, be part of a development team for building common assessments at the district level, or serve as leaders in the district to promote change in mathematics education. When instruction is public, teachers learn about the power of collaboration for improving their practice and lose the fear of having observers in the classroom. With structured observation protocols and regular opportunities for feedback, teachers forget about working in isolation and focus more on the ways they can work together on student achievement. Finally, with new tools and customized support, teachers can access the individual training and feedback they need to make good practices part of their daily instruction.

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### **About *Practices Worthy of Attention: Local Innovations in Strengthening Secondary Mathematics***

*Practices Worthy of Attention* is a joint initiative of Achieve, Inc. ([www.achieve.org](http://www.achieve.org)), and the Charles A. Dana Center at The University of Texas at Austin ([www.utdanacenter.org](http://www.utdanacenter.org)). The initiative is led by Pamela L. Paek, a research associate at the Dana Center, who, in 2006, examined 22 program, school, and district practices that showed promise—based on early evidence and observation—of strengthening secondary mathematics teaching and learning.

Our goal was to document practitioners' descriptions of *what is really happening* in the field to strengthen secondary mathematics education around the country. Thus, while the practice highlighted may be common, the specific structures and strategies used to implement the practice are worthy of attention. These initial investigations set out to mark these practices for future rigorous scientific inquiry by Dana Center and other researchers.

Ultimately, we hope to create a community of inquiry made up of university researchers working with administrators and teachers from featured schools and districts to more rigorously research how effectively these practices improve secondary mathematics learning for all students.

**Reports and practice profiles.** An executive summary details the methods for this initiative and analyzes themes. Two cross-case analyses discuss specific strategies for raising student achievement and building teacher capacity. Brief profiles describe each practice. All of these publications are available on our website at [www.utdanacenter.org](http://www.utdanacenter.org).

**Data.** In all cases, data about the practice were provided by the program, school, or district studied as part of a description of their practice. We did not independently analyze data gathered through a consistent assessment tool, and we did not evaluate their uses of data for measuring effectiveness. Thus, the data in the practice profiles are intended not to prove the practice's effectiveness from a research perspective, but to paint a detailed picture of the practice and what data were used by the program, school, or district to gauge how well it was working.

**Theoretical frameworks.** In some cases, district staff mentioned specific literature on theory or practice that they used when they developed the practice we highlight. In those cases, we cite that literature in our discussion of the practice.

### **How to cite this cross-case analysis**

Paek, P. L. (2008, January). Building teacher capacity. Cross-case analysis from *Practices worthy of attention: Local innovations in strengthening secondary mathematics*. Austin, TX: Charles A. Dana Center at The University of Texas at Austin.

### **Where to find the profiles**

For profiles of the practices discussed in this cross-case analysis, see our website at [www.utdanacenter.org](http://www.utdanacenter.org). The practices discussed here are:

Agile Mind; Asset-Based Instruction: Boston Public Schools; Collaboration of Special Education and Mathematics Teachers: Denver Public Schools; Common Vision for Mathematics Success: Phoenix Union High School District; Connecting Mathematics Assessment to Instruction: Anchorage School District; English Language Learners Mathematics Initiative: New York City Department of Education; K–12 Aligned Mathematics Curriculum: Bellevue School District; Keeping Learning on Track: Cleveland Municipal School District; Local Assessment System: Lamoille South Supervisory Union; Mathematics Coaching: Silicon Valley Mathematics Initiative; Mathematics Teacher Leaders: Portland Public Schools; Partnership for High Achievement; Professional Learning Communities: Columbus Public Schools; YES College Preparatory School