Stated Briefly

Gearing up to teach the Common Core State Standards for Mathematics in the rural Northeast Region

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Rural educators in the Northeast Region are beginning to implement the Common Core State Standards for Mathematics. For the implementation to be successful, teachers reported needing more time to collaborate—both to learn the content and to improve their instruction to support all students' learning—and increased access to high-quality curricula and professional development opportunities.

Why this study?

Math educators around the country are gearing up to teach the Common Core State Standards for Mathematics (CCSSM), the product of the first systematic U.S. movement to follow high-performing countries' math curricular principles. Adopted by 43 states (Carmichael, Martino, Porter-Magee, & Wilson,

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2010; Kober & Rentner, 2011), the CCSSM emphasizes conceptual understanding, coherence among topics, abstract reasoning, and problem solving. This emphasis represents a major shift in content and pedagogy from existing state standards, which focus on mastering discrete skills and procedures (Kober & Rentner, 2012).

The CCSSM include the Standards for Mathematical Content, outlining what students should understand and be able to do (for example, number and operations in base ten, measurement and data), and the Standards for Mathematical Practice, the capacities that educators need to develop in their students (for example, making sense of problems, persevering in solving them, and constructing viable arguments). The Standards for Mathematical Practice cut across all grade levels and intersect with the Standards for Mathematical Content.

Implementing the CCSSM will be challenging for all math educators (Kober & Rentner, 2011), but especially educators in rural schools: recent survey data indicate that educators in small, rural schools often feel isolated and overburdened when asked to make substantial changes in their math and science teaching and often desire additional instructional resources and supports (Babione, 2010; Howley, Wood, & Hough, 2011). Members of the Northeast Rural Districts Research Alliance (NRDRA), who are committed to supporting rural educators' effectiveness, expressed interest in learning about rural schools' and districts' most pressing needs in implementing CCSSM; what states and districts are doing to prepare for and address these needs; what curricular and professional development opportunities are available and being developed; and how online technology, in particular, can be used to expand access to resources.

In response to this interest, Regional Educational Laboratory Northeast & Islands (REL-NEI) researchers, in collaboration with the NRDRA, designed a needs assessment of rural Northeast Region educators who are preparing or have begun to implement the CCSSM. Researchers interviewed 10 state and district educators from Maine, New Hampshire, New York, and Vermont and surveyed 186 rural grade 3–8 math teachers from 48 rural districts in those states. The interviews focused on state and district leaders' familiarity with and preparation for implementing the CCSSM; implementation plans and efforts; perceived challenges facing rural schools, districts, and teachers; and critical supports and resources needed for administrators and teachers in rural schools.

Though the study was conducted to address specific needs identified by rural administrators and teachers in the NRDRA, the results may be relevant to broader policymaker and practitioner audiences. For example, state-, district- and school-level math coordinators who are supporting teachers' implementation of the CCSSM may share some of the same implementation challenges reported by educators in the NRDRA and may benefit from hearing what other educators say they need to overcome similar sets of challenges.

Study findings

The needs assessment produced two sets of findings. The first set describes the resources that states and districts have made available to rural educators in the Northeast Region to support CCSSM preparation and early implementation. The second set describes the most pressing challenges and needs that administrators and teachers face as they begin to implement the CCSSM.

Preparation efforts in rural districts often focus on providing professional development and networking opportunities

The needs assessment indicated that many rural educators in the Northeast Region had access to professional development and networking opportunities designed to help them understand what is required to implement the CCSSM. Commonly reported opportunities included:

- State-developed websites that provide guidance for and links to support implementation of the CCSSM.

- Regional meetings and support through regional experts.
- Convening of district grade-level teams that meet to unpack the standards.
- Informational meetings about the CCSSM.
- Adoption of textbook and other CCSSM-aligned materials.
- District- and school-based professional development.

Many of these supports focused on the timeline for and expected changes associated with implementation of the CCSSM or the CCSSM content standards and developing teachers' understanding of the math involved. Few of these supports focused on the practice standards or specific instructional approaches that promote proficiency with the CCSSM.

In light of these resources and supports, the majority of teachers (56 percent) reported that they felt "somewhat prepared" to integrate the CCSSM into their daily math instruction.

Ongoing challenges and needs for rural educators include time, support in changing instruction, availability of quality instructional materials, and opportunities for collaboration

The needs assessment indicated that 91 percent of participating teachers had begun to integrate the CCSSM into their instructional practices. Teachers identified the following instructional challenges associated with their initial implementation efforts:

- Shifting the focus of teaching from covering topics to deepening students' understanding of the major work in each grade (51 percent of teachers identified this practice as challenging).
- Helping students develop the conceptual understanding outlined in the CCSSM (47 percent).
- Addressing and building on standards that had previously been taught in a different grade or course (41 percent).
- Helping students develop procedural fluency as outlined in the CCSSM (34 percent).
- Helping students develop the math practices outlined in the CSSM (33 percent).

Teachers also identified the following CCSSM content areas as the most demanding:

- Number and operations—fractions (53 percent of teachers identified this topic as demanding).
- Operations and algebraic thinking (39 percent).
- Ratios and proportional relationships (33 percent).
- Expressions and equations (30 percent).

To meet these challenges, state and district administrators and teachers identified the following needs:

- *Time to review the standards and plan instruction.* State and district administrators reported that teachers and curriculum coordinators need time to review the standards and to individually and collaboratively plan instruction that meets these new standards. Some 47 percent of teachers agreed that allotting time to discuss and plan lessons with colleagues was needed. According to state and district administrators, elementary school teachers have many demands on their time, including the Common Core State Standards for English language arts.
- *Support for changing instructional practices.* According to administrators who participated in the study, elementary teachers tend to be generalists rather than math experts. Because the CCSSM require deep conceptual understanding of math, many state and district administrators believed additional training was necessary for these teachers to implement the CCSSM effectively. Some 34 percent of teachers identified changing practice to integrate the CCSSM effectively as a need. In addition, teachers reported needing support for creating lesson plans that embody the CCSSM practice standards (40 percent) and content standards (37 percent).

- *Access to quality resources and materials.* Some 46 percent of teachers said that they needed access to quality textbooks and instructional materials that were aligned with the CCSSM. Administrators agreed but reported that it was difficult to identify quality resources from among the many available CCSSM resources.

Limitations of the study

The study relied on interview and survey self-reported data from a convenience sample with a limited number of administrators and rural teachers in grades 3–8 who volunteered for the study. Their perspectives may not fully represent those of their peers or accurately capture the needs of all rural educators in Maine, New Hampshire, New York, and Vermont.

The study's findings may not hold for educators who are less familiar with the standards and have not begun implementing them. Furthermore, the extent of CCSSM implementation varies considerably and includes a wide range of implementation efforts (for example, teachers who have tried a single task or lesson versus teachers who have implemented an entire instructional unit or multiple units). Thus, the findings may not apply to educators uniformly.

Next steps

The needs sensing activities of this study suggest several next steps for rural educators working toward implementing the CCSSM:

- Preparation efforts in the rural districts included in this study have helped teachers understand the standards. Many teachers reported in the survey that they believe they know the standards well. Offer teachers similar help in implementing the standards, especially in terms of acquiring the content knowledge needed to shift instruction so that all students gain the deep conceptual understanding of math required by the CCSSM.
- Aligning the curriculum, identifying quality materials and tasks, planning instruction, and integrating the new standards will take a lot of time. Provide teachers more time to collaborate on this work and more opportunities to meet and share resources, both within and across schools, and even across states. Such collaboration could also help reduce costs at a time when resources are scarce.
- Some 75 percent of administrators reported knowing of lots of resources that were CCSSM-aligned but finding it difficult to wade through and identify the most useful and pertinent resources for educators in their schools and districts. Teachers also reported limited access to instructional materials to help them implement the CCSSM. Conduct further research and develop a system for evaluating CCSSM-aligned resources to help educators effectively meet their needs.

Note

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