

How CPS Teachers Use, Teach, and Understand the CMSI-Supported Math Curricula

A Summary Report for the 2006-07 Academic Year

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Purpose of this Report

This summary report presents key findings from evaluation research conducted by the UIC PRAIRIE Group during the 2006-07 school year for the Office of Math and Science (OMS) of the Chicago Public Schools. The audience for this report is teachers and administrators at schools that have participated in this research.

The PRAIRIE Group has served as an external evaluator for OMS since the Chicago Math and Science Initiative began in 2003. The Chicago Math and Science Initiative (CMSI) supports the following four curricula: Everyday Mathematics, Math Trailblazers, Connected Math, and Math Thematics. For schools and teachers using these curricula, the CMSI provides various supports, including: school visits from citywide specialists, grade-level professional development sessions, and training for school-based math specialists.

The CMSI promotes particular kinds of math practices across all these curricula, such as: small group work, hands-on activities, inquiry-based learning, use of materials and other representations; oral and written communication of math ideas; multiple approaches to solving math problems; balancing different kinds of math activities (e.g. calculations, problem-solving, discussing concepts).

Each year the evaluators provide findings and recommendations in hopes of contributing to decision-making by the Office of Math and Science around resources, supports, continuing education, and policies that support math education across the District.¹ This year's evaluation research focused on the following issues related to teachers' math instruction and curriculum use:

1. How teachers use CMSI-supported curricula when they teach math
2. The contexts and values that influence teachers' use of the curricula
3. How teachers develop as users of the curricula over time
4. How CMSI supports contribute to teachers' curriculum use and math instruction

The purpose of this report is to summarize patterns in these areas, across the schools where we gathered data in 2006-07. We conclude the report with some questions for personal or group reflection.

¹ Individuals interested in receiving copies of this year's or past year's reports from this external evaluation can visit the CPS Department of Program Evaluation website at http://research.cps.k12.il.us/cps/accountweb/Evaluation/View_Evaluation_Reports/View_Evaluations_by_Date/ or contact Bret Feranchak (773-553-2497; bferanchak@cps.k12.il.us)

Data Collection Methods and Sources

The evaluators gathered data from 99 teachers at 9 schools between September 2006 and June 2007, using the following methods:

1. Focus group discussions with teachers according to their grade level. In the focus groups teachers shared their experiences and views around the following kinds of questions:
 - How do you teach the math curriculum? Do you supplement, skip, or modify the CMSI-supported curriculum in any ways? If so, why?
 - How do you make decisions about the ways you use the curriculum? What kinds of contexts and supports influence how you teach math and use the curriculum?
 - When and how do you reflect on your math teaching practice, individually and/or with your colleagues?

2. A background information sheet that teachers were asked to fill out prior to the focus group discussion. The sheet asked teachers about such things as:
 - years teaching and years teaching at the current school;
 - years of using CMSI-supported curricula
 - attendance at professional development related to the curricula

3. Classroom observations of a sample of teachers across schools and grade levels, followed by debrief conversations with teachers. The observations and debriefs focused on the following kinds of topics:
 - How teachers taught the math lesson and why they did so in a particular way on that day. For instance: how did they present the key topic, interact with the students, assess student learning in the course of the lesson?
 - How teachers used the math curriculum and why they used it in a particular way on that day. For instance: Did they follow the curriculum as is, modify, or skip parts of the curriculum? If so, what were their reasons? Did they supplement the curriculum, and if so, for what reasons?
 - How teachers engaged students in the math lesson. For instance, did they organize their students into groups? Did they engage students in different kinds of learning activities? Did they encourage multiple ways of solving problems? Did they encourage students to dialogue with each other over problems?
 - How the teachers felt about the lesson observed and how it compared to other lessons. For instance, did the teachers cover all the material they hoped to cover? Did the teachers modify the lesson from what was planned? How in the teachers' view did this lesson compare to previous lessons? If the teachers did something different than usual, why was that?

Summary of Key Findings

Analysis of the data across teachers and schools offers some overarching findings about math instruction and use of CMSI-supported curricula in elementary schools with three or four years of participation in the CMSI, which we summarize below:

1. How teachers use CMSI-supported curricula and teach math

Use of specific CMSI texts and materials:

- Teachers' use varied considerably in terms of their use of curricular texts and manipulatives. This was true regardless of which curriculum they used.
- More teachers used the curriculum as intended than in past years.
- Most teachers modified or supplemented the curriculum, or skipped parts of the curriculum.

Teaching practices more generally:

- Teachers grouped their students in multiple ways during the classes we observed.
- Most teachers did most of the talking during the lessons observed.
- About half the teachers pushed students to engage in problem solving.
- Teachers varied greatly in their formal and informal assessment practices.

2. Contexts and values that influence teachers' curriculum use and math teaching

- Time: Some teachers skipped or modified lessons or lesson activities if they had less than 60 minutes a day for math. Others did so in order to keep pace with what they felt students needed to learn prior to March ISAT exams.
- Materials: Some teachers who did not have a full inventory of materials skipped or modified parts of lessons or how they carried them out.
- Classroom composition: Teachers reported modifying their use or instruction when their students had a range of abilities or challenges. For example:
 - When the classroom was bilingual
 - When the classroom was split across two grades
 - When the classroom included several special education students:

Special education teachers were severely limited in their ability to use the CMSI curricula and curricular materials. These teachers emphasized that because of the varying ages and abilities of their students, using a grade-level specific text for math required significant differentiation.
- Assessment of students: Many teachers described modifying their use and instruction based on their assessment of their students' overall academic performance, familiarity with the curricula, or classroom behavior. For instance:
 - Teachers whose students were familiar with the curriculum often indicated that this made it easier to teach the curriculum as intended, while teachers whose students were not familiar with the curriculum often identified this as making it harder to use the curriculum.

- Only a few teachers had developed ways of implementing the curriculum that they felt worked for students they considered to be inadequately prepared for the curriculum or “low achieving.” Many teachers felt that the CMSI-supported curricula were better suited for “high achieving” students and gave many reasons for altering their use of curricula and practices for their own students.
- Many teachers modified their use of the curricula and math instruction in response to their assessment of the overall quality of classroom behavior.
- Some teachers chose to skip elements of the curriculum (e.g. use of manipulatives) or modify their instructional practices (e.g. taking away group work) as disciplinary measures.

3. How teachers develop as users of CMSI curricula

- We did not find evidence that a teacher’s years teaching in their career, years teaching at their current school, or endorsement status determined how they used the CMSI curricula.
- Teachers felt they were more successful teaching math using CMSI curricula after several years’ experience with the curricula, professional development, dialogue with informal teacher peer groups, and other supports.

4. How CMSI supports contribute to teachers’ curriculum use

- All teachers expressed the desire to receive ongoing supports of one kind or another. They identified distinct ways in which these supports could contribute to their improved implementation of CMSI-supported curricula. Special education teachers expressed a strong need for supports from the CMSI, such as professional development and materials that could help them differentiate the curricula and implement them more completely.
- Teachers expressed a range of views about the value or usefulness of the supports they had received. For instance, some said that the professional development or presence of an in-school specialist or visit from a citywide specialist had been useful. Many teachers who found professional development sessions useful referred to the relevance of the content and/or the experience of the instructor; several teachers who found specialist support valuable described the “practical” advice the specialist offered, or how the specialist offered an extra “pair of hands” or “set of eyes” in helping the teacher move the lesson along or differentiate instruction. Other teachers indicated that the professional development or in-school specialist had not been particularly helpful. In many cases these teachers described the professional developer or specialist as lacking in classroom experience or familiarity with the curriculum, or as unable to address issues specific to their classroom situations.
- In several cases, teachers who have been using the CMSI curricula and appear committed to it may be adopting instructional practices that are not consistent with the curricula, as a result of a lack of supports either at the school or district level or both. For instance, some teachers with an investment in using the curriculum did not have the accompanying materials needed to implement. Other teachers described supplementing because they were either unaware that the curriculum contained instructional content or materials that they thought were lacking. Yet others were not able to keep to pace because they were not allotted the full hour for math instruction – due in some cases to scheduling of classes, in other cases to school-wide prioritization of other subject areas over mathematics.

Questions for Reflection

- How do these findings resonate with your own understanding of your use of CMSI materials?
- What supports would you like to receive at this juncture of your use of these materials? Is this the same or different from the supports your colleagues would like to receive? What structures can your administration help put in place to help provide these supports?
- Where would you like to be in your use of CMSI materials two years from now? five years from now? What will need to happen to help you achieve these goals?