

Patterns and Prevalence in the Use of CMSI-Supported Curricula by CPS K-8 Teachers

A Report for the CPS Office of Mathematics and Science
Prepared by the PRAIRIE Group, UIC College of Education

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UIC PRAIRIE

For further information, contact Stacy Wenzel at swenzel@uic.edu or 312-413-9221.

UIC PRAIRIE evaluators contributing to this report include (in descending alphabetical order) Stacy Wenzel, Lisa Raphael, Janise Hurtig, Carol Fendt, Meghan Burke, and Wendy Atterberry.

The conclusions drawn in this report reflect the viewpoints of the authors. While there are many potential viewpoints, these reflect a systematic analysis of data by external evaluators. The hope is that these findings can facilitate improvement of this and related programs through open discussion and consideration of data-driven understandings.

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1. INTRODUCTION TO THE REPORT

Background

This report has been prepared with the goal of informing the Chicago Public Schools (CPS) Office of Math and Science (OMS) about classroom math instruction. It has been prepared in the context of the CPS's continued implementation of the Chicago Math and Science Initiative (CMSI), a comprehensive program begun in 2003 that aims to improve math and science education in elementary schools (grades K-8). The audiences for this report are the leadership teams of the OMS and the CPS Chief Education Office.

This report builds on previous external evaluation studies by UIC that examined how district-, Area-, and school level influences affect the implementation of CMSI curricula by a school's faculty. These studies identified ways implementation related to a school's management of curricular materials, leadership by principals, in-school support of teachers by instructional leaders, professional development workshop attendance of teachers and the ways the Initiative was adopted by the school (voluntarily or mandated). Because the primary unit of analysis of these earlier studies has been the school, and the focus has been on understanding how implementation develops in relation to multiple contextual factors, we used comparative case study of schools as the primary research methodology.

The principal aim of the UIC external evaluation of the CMSI during 2006-07 is to provide a deeper and more nuanced understanding of the nature of teachers' incorporation of CMSI-supported curricula into their math instruction by examining what happens in the classrooms of the teachers who teach math to CPS K-8 students in schools that have committed to using CMSI-supported math curricula. Where the analysis of 2003-2006 external evaluation findings focused on the school level, the 2006-07 evaluation findings are analyzed at the level of the individual teacher or small groups of teachers who collaborate in planning or thinking about how to teach math. In a November 2006 report we drew on data from focus groups with teachers talking about their use of CMSI supported math curricula to offer initial insights into the ways teachers reported using CMSI supported math curricula and the types of rationales they gave for their use. By examining reported use in relation to rationale, we aimed to provide an initial framework for considering how teachers' sense-making around the CMSI curricula develops and affects the nature and extent of their incorporation of CMSI-supported curricula into their math instruction. This current report draws on the triangulation of the initial focus group data with teacher background data, a selective sample of observations of individual teachers teaching math lessons and follow-up interviews with those teachers. Quantitative and qualitative analysis of these data allows us to elaborate on the November 2006 findings in two ways. First, we look at patterns in the prevalence of different kinds of teacher use of the curriculum and relate those patterns to the kinds of rationale they provide for their use. Second, we consider how particular aspects of teachers' experiences, backgrounds and school contexts relate to these patterns. In the report we also relate these two sets of findings to each other in an effort to embed teachers' specific instances of use and rationale in a more nuanced process of sense-making around math instruction.

Next steps in the external evaluation will include further data collection and analysis at the levels of the classroom and the school in order to: (a) better understand how patterns in teachers' math instruction relate to contextual school factors; and (b) acquire a deeper understanding of how multiple factors come together to influence teachers' decisions around math instruction over time; and (c) consider how the district can support changes in use and sense-making that promote more effective instruction. While curricula are implemented at the school level, we believe that understanding these issues at the individual level provides a basis for understanding the intricacies of these issues at the school level. By building up from the teacher level we will be able to offer a more actionable understanding of the factors that account for changes in the nature and extent of curricular implementation at the school level.

This evaluation aims to be useful to the audiences of the CPS Department of Program Evaluation, the leadership team of the Office of Math and Science, and the Chief Educational Officer. It is based on rigorous data collection and analysis that is conducted in such a way as to provide timely feedback to a district in which the current status of implementation in schools needs to be considered in January and February in order to make decisions of funding and policy that will go into effect in September of the next year.

Structure of the Report

We begin this report by revisiting our research questions—the focus of this report—and the methodology we used to answer these questions. Next, we provide the analytical framework that guided our data collection and analysis of findings. This includes a description of the analytical categories and subcategories and the analytical strategies we developed. The

final section includes the findings of this report interspersed with questions for discussion between OMS staff and CMSI stakeholders.

2. RESEARCH QUESTIONS AND METHODOLOGY

The overall 2006-07 UIC external evaluation is being conducted in response to a series of evaluation questions that were negotiated between the external evaluators and the district during summer of 2006 and documented in an August 30, 2006 workscope. The broad themes addressed by those questions include: (1) an understanding of how teachers use CMSI curricula and make sense of that use; and (2) an understanding of the factors that influence teachers’ use and sense-making around their use of CMSI-supported curricula. This report responds to a subset of those questions, as follows:

- What is the nature of teachers’ use of the CMSI supported curricular materials in CPS/CMSI classrooms?
- What are the issues and values that influence teachers’ decision-making about the use of CMSI supported curricula?

The following sections describe the methodological procedures that were developed to understand and answer these evaluation questions within the context of this evaluation.

Selection Process for Sampling Teachers

The findings presented in this report are based primarily on the self-reports of a sample of CPS teachers regarding how they plan and teach math, how they use CMSI-supported curricula, and their reasons for using or not using those curricula in their classrooms in particular ways. Eighty teachers were interviewed from September through December of 2006 at their eight schools, either in focus group settings or individually in the case of a few teachers. Most (N=72) teachers also completed short background surveys.¹ The purpose of these surveys was to collect comparable data about teacher self-reported professional experiences and professional development attendance, in addition to some information regarding the curriculum-specific materials they may be using. An additional 19 teachers from one school did not interview but completed short written reflection forms along with the short background survey. The protocol was modified for this school because on the day made available to meet with teachers there was only enough time for them to fill out short surveys and not enough to conduct focus groups. Fourteen observations with follow-up interviews were conducted with a subset of the 80 teachers who had participated in focus groups.

A total of 99 individual teachers contributed to this study. The sample of teachers was drawn from schools that have been part of the UIC external evaluation of CMSI over the past four years. The characteristics of these schools mirror typical CPS elementary schools using CMSI-supported curricula. These schools come from 11 of the 17 Areas of the district, representing the multiple configurations of CMSI curricula in use at each school, and representing the multiple ways CMSI was adopted in schools over the last four years. This report is based on data collected from 9 of 13 case study schools that the UIC external evaluation study currently follows. Of these nine schools, five have been studied since 2003-04: two of these are former Readiness schools (both with in-school specialists 2006-07); the other three, Intensive Support schools (one having an in-school specialist 2006-07). Two of the nine schools joined the study in 2004-05 as probation schools mandated to implement CMSI. One of these had an in-school specialist in 2006-07. Two other schools began implementing in 2005-06. Both had in-school support from city-wide specialists 2005-06. In 2006-07, neither had a city-wide specialist, but one had an in-school specialist. The table below illustrates the sample of case study schools.

Figure 1: Case Study Schools

Schools Studied Beginning in 2003-2004

Readiness	Readiness	Intensive Support	Intensive Support	Intensive Support
Specialist: 2006-07	Specialist: 2006-07	Specialist: 2006-07	No Specialist	No Specialist

Schools Studied Beginning in 2004-05

Probation School	Probation School
Specialist: 2006-07	No Specialist

¹ Background surveys were tailored according to which math curriculum was taught at a school. These surveys were created in consultation of professional development experts who work with these curricula as part of the CMSI. Copies of the four survey protocols are attached at the end of this report in the Appendices.

Schools Studied Beginning in 2005-06

Probation School	Probation School
City-wide Specialist: 2005-06	City-wide Specialist 2005-06
Specialist: 2006-07	No Specialist

All teachers teaching math at these nine schools were invited to participate in focus groups. Approximately one-half of those teachers participated in this study. The participation rate varied by school from 25% to over 90% of math teachers in the school.

Table 1 describes the teachers who shared their insights through focus groups for our use in this report.

Table 1: Teacher Sample Experiences and School Contexts²

Mean years teaching this curriculum	Mean years teaching at school	Mean years teaching	Endorsed in math	Enrolled in endorsement program
2.4 (1.9 SD)	6.1 (5.9 SD)	12.6 (8.9 SD)	22%	12%

Primary grades teachers (K-5)	Middle grades teachers (6-8)	Sp Ed teachers (primary and/or middle)	English Language Learners teachers (primary and/or middle)
50%	24%	10%	7%

Attended some CMSI professional development	Did not attend CMSI professional development	At school that voluntarily implemented CMSI curricula	At school mandated to implement CMSI curricula
71%	29%	55%	45%

At school and grade level using Everyday Math	At school and grade level using Math Trailblazers	At school and grade level using Connected Math	At school and grade level using Math Thematics
33%	31%	17%	19%

² See Technical Appendix for a closer look at the data used in this sample.

Teachers that have a School-based Math Specialist	Teachers that do not have a School-based Math Specialist
41 (41%)	58 (59%)
Schools that have a School-based Math Specialist	Schools that do not have a School-based Math Specialist
4 (44%)	5 (56%)

Teachers whose school had 0 visits from OMS during 2006	Teachers whose school had 1 visit from OMS during 2006	Teachers whose school had 2 visits from OMS during 2006	Teachers whose school had 3 visits from OMS during 2006	Teachers whose school had 8 visits from OMS during 2006	Teachers whose school had 21 visits from OMS during 2006	Teachers whose school had 28 visits from OMS during 2006
24 (24%)	9 (9%)	27 (27%)	14 (14%)	10 (10%)	8 (8%)	7 (7%)
School that had 0 visits from OMS during 2006	School that had 1 visit from OMS during 2006	School that had 2 visits from OMS during 2006	School that had 3 visits from OMS during 2006	School that had 8 visits from OMS during 2006	School that had 21 visits from OMS during 2006	School that had 28 visits from OMS during 2006
2 (22%)	1 (11%)	2 (22%)	1 (11%)	1 (11%)	1 (11%)	1 (11%)

While our case study schools mirror typical CPS elementary schools using CMSI-supported curricula in terms of Areas of the city represented, types of curricular configurations, CMSI adoption conditions, and types of school level and district supports available to teachers implementing CMSI curricula³, to date we have not had access to district-wide data on the teacher descriptives above., Therefore, we cannot say whether these teachers represent the population of CPS teachers.

Data Collection Process

Focus groups were set up at schools by contacting the school principal, assistant principal or math specialist. The evaluator who set up these school visits was a senior researcher who has visited almost all the schools in the past and reminded the administrators of the purpose of the evaluation work and the confidential ways the data would be used. These administrators then invited their teachers to participate in the focus groups. Focus groups were convened at each school at a time the students had been dismissed and teachers were engaged in professional development work. Several external evaluators visited the school and each lead a focus group of teachers, typically divided by grade levels. The evaluation team that went out to each school included both veteran evaluators recognized by teachers from former visits and newer members of the staff on their first visit to the school. All teachers were informed of the voluntary and confidential nature of the data collection.

A total of 26 focus groups were conducted with 80 consenting teachers. The size of the groups ranged from 1 to 7 teachers, with a typical group having four teachers involved. Focus groups varied in duration from 45 to over 60 minutes. The focus group protocol is included in the Appendix. In brief, each group of teachers were asked to talk together about how they taught math and used the CMSI supported curriculum their school adopted, why they used the curricular materials the way they did, and if and how they talked together on a regular basis about their math instruction. Focus group conversations were audio-taped and transcribed with the exception of two groups that requested they not be recorded and one group during which there was an audio-recorder malfunction.

³ See earlier evaluation reports that describe sampling such as “Report A” from August 2004.

3. ANALYTIC FRAMEWORK

The framework that guided the collection of data and analysis of findings in this report is based on certain ideas about how to examine and explore the development of teachers' instructional practices over time in ways that can support effective decision-making by districts.⁴ Specifically, we understand that in order to analyze teachers' instructional practices in meaningful and actionable ways, it is important to examine the relationship between the ways teachers use (or don't use) a particular math curriculum, and the kinds of rationales they offer for their use.

However, simply examining use in relation to rationale will only provide a snapshot, or static picture, of teachers' use at a given time. In reality, the relationship between use and rationale is dynamic and interactive: teachers' initial use and the rationales they provide for that use are influenced by the sense they have already made of the curriculum in light of multiple factors (past teaching experience, school context, information they receive about the curriculum and about math instruction, beliefs they have about their students' educational abilities, for instance). As they use the curriculum, identify student learning outcomes, and engage with others around the curriculum, their sense-making may change, affecting their use and how they rationalize use. Changes in use can in turn affect the meaning they make of information they receive about the curriculum, and can even change the context in which they teach.⁵

Analysis of focus group conversations uncovered several instances of such changes. For instance, a middle grade teacher recounted how his/her use of the curriculum changed from the first to second year of implementation, as follows:

Teacher: "When I first started this program—this is my second year—the first year was rough. It was new for me. It was new for the students. I didn't have any PD training. So I was really fumbling and trying to understand the book, okay...I didn't understand it. It was very hard. It was very difficult until after I started going to the professional development and then it began to make sense. But it was only until then. It was rough because I was like "how is this supposed to fit in with this?" and it didn't seem to me like there was enough material for practice and application to go with what they wanted me to do.

Researcher: Did you find yourself supplementing it with other materials?

Teacher: I was supplementing it because like I said when it was new to me I didn't see the work that went with the book the set up. Until they said, "it's all aligned." But before then I had to pull materials from other sources.

Researcher: How long was it before you had the professional development training? How long were you in the dark, I guess?

Teacher: Well, I came in September. And they had had a professional development—the big one in the summer—but I didn't go to that one—and when I was first hired, I didn't realize that I could have gone to a summer session. I didn't really get the first professional development until November—whatever the first professional development session was—that was the first one that I attended. And then it began to fall in place. But I had already had the students from September up until the time of the professional development trying to teach out of this book, and it didn't make sense to me.

Researcher: Were you able to—once you received the professional development—reorient the way you taught the class?

⁴ These ideas are informed by the educational literature that looks at how teachers' experiences, beliefs, and engagement with curricular reforms/innovations affects their implementation. See for instance Andrew Gitlin & Frank Margolis, "The political aspect of reform: teacher resistance as good sense," *American Journal of Education* v 103(4): 377-405, 1995; Amanda Datnow & Marisa Castellano, "Teachers' responses to Success for All: How beliefs, experiences, and adaptations shape implementation," *American Educational Research Journal*, v 37(3): 775-799, 2000; Datnow, Amanda, Lea Hubbard, & Hugh Mehan. *Extending Educational Reform: From One School to Many*. New York: Routledge Falmer, 2002.

⁵ Our conceptual framework regarding the dynamic relationship between teachers' use and the contexts of use is informed by scholarship on teaching, learning, and other educational practices as "situated activity." See for instance Chaiklin, Seth & Jean Lave, eds., *Understanding Practice; Perspectives on Activity and Context*. Cambridge: Cambridge University Press, 1996; Wenger, Etienne, *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press, 1998; Barton, David & Karen Trusting, eds., *Beyond Communities of Practice: Language, Power, and Social Context*. Cambridge: Cambridge University Press, 2005.

Teacher: Right, I was. Like I said, I was supplementing a lot. And I saw what they wanted taught, so I supplemented and brought material in until after the professional development. Then I was able to align the workbook, the text book, you know, together and then implement the program.⁶

As the above interchange illustrates, teachers make conscious decisions about their use as they take in new information and determine whether the changed sense they have of the curriculum can inform their use in relation to their assessment of students' learning abilities and other important aspects of the context in which they teach.

This dynamic nexus of **USE–RATIONALE–SCHOOL CONTEXT–INFORMATION SOURCES** is the analytic framework that guides our study of teacher curriculum use and sense-making, and informs the ways in which we collected and analyzed data and present findings in this report. It important to point out that these four realms are not just analytic tools; they are all areas of activity and sense-making that school districts can choose to act upon. School districts can directly support teacher use; they can engage with teacher sense-making in ways that are meant to affect their rationales (by modifying the content of PD, for instance); and/or they can choose to focus on impacting facets of the school context and sources of information that teachers draw on in making sense of the curriculum (e.g., the nature of discourse during grade level teacher meetings; notions about the role that parents should play in supporting student learning). The example of a teacher's report regarding what led him/her to make changes in his/her use of curriculum is useful in identifying the specific messages that were meaningful to that teacher (e.g. "it is aligned") and actionable for him or her in the context of the classroom and school.

Development of Analytic Categories

In this section we define the three key *categories* as we have used them to analyze findings for this report, namely USE, RATIONALE, SCHOOL CONTEXT and /INFORMATION SOURCES. We also describe the analytic process by which we discerned meaningful *subcategories* for each of these key categories.

Figure 2: Analytic Categories

Broad categories	Subcategories	Description of variable: Unless otherwise noted, all drawn from coded focus groups of teachers self reporting their experiences teaching math
Teacher use of curricula		
	Never use	No part of the curriculum is ever used.
	Use as is	Curriculum is used exactly as directed without any supplementation or modification.
	Leave out PART of lesson	Part of lesson is left out of the curriculum, but curriculum is otherwise followed
	Leave out WHOLE lesson	An entire lesson in a unit is left out, but curriculum is otherwise followed
	Leave out GAMES	Games are sometimes or always left out of curriculum, but curriculum is otherwise followed
	Leave out Manipulatives	Curricular manipulatives and variables are sometimes or always left out of curriculum, but curriculum is otherwise followed
	Leave out everything	Does not follow the CMSI curriculum for one day or one unit
	Leave out according to OMS Pacing Guide	Follows the OMS pacing guide in determining which sections or lessons to leave out
	Modify time	Use more or less time for a lesson, game, or activity than the curriculum dictates
	Reorder sequence	Change the order in which parts of curriculum are taught
	Modify use of assessment	Changing the assessment tools included in the curriculum by editing, re-ordering, leaving out, or changing the use of text, materials, or manipulatives
	Translated into Spanish	Parts of or entire curriculum is translated into Spanish by the teacher/someone at the school
	Modify how use group	Curriculum is followed, but group work may be modified in terms of

	work	directions, materials, manipulatives, and number of students in groups
	Modify Other	Curriculum is followed, but certain aspects of the curriculum may be modified by the teacher such as introductions to lessons
	Supplement with basic skills and practice	Outside materials are added to the curriculum to introduce, review, and increase the practice of basic skills
	Supplement with assessment-related activities	Outside materials are added to the curriculum for assessment purposes, including games, activities, tests, and worksheets
	Supplement with extended response practice	Outside materials are added to the curriculum to introduce, review, and increase the practice of extended response
	Supplement with other	Outside materials are added to the curriculum for anything other than basic skills and practice, assessment-related, and extended response
Rationale for teaching choices		
	Rationale Teacher View SELF	Teacher's use of the curriculum is influenced by his or her math content knowledge and experience
	Rationale Teacher View CURRICULUM	Teacher's use of curriculum is influenced by his or her view of the curriculum which can be based on a number of different factors, including timing, pacing, materials, manipulatives, literature/language, etc.
	Rationale Teacher View STUDENTS	Teacher's use of curriculum is influenced by his or her view of the relationship between the students and the curriculum, including level-appropriateness, and students' engagement or disengagement with parts or all of the lessons and/or units
	Rationale Teacher View TEACHING & LEARNING	Teacher's use of the curriculum is influenced by his/her view of what students need to learn in math and how students learn math.
	Rationale Teacher View PARENTS	Teacher's use of curriculum is influenced by his or her view of parents, including perceived knowledge of parents, the perceived relationship between parents and students, parents' perceived investment in helping students with homework
	Rationale LAST YR THIS CONFUSED THEM or LAST YEAR I LEARNED SOMETHING from teaching it	Teacher's use of curriculum is influenced by feelings developed from last year's use/lack of use
	Rationale ISAT	Teacher's use of curriculum is influenced by ISAT preparation
	Rationale Time	Teacher's use of curriculum is influenced by amount of time it takes to do a lesson, unit, or activity in relationship to how much time in the day is allotted for the subject/class period
	Less than 60 minutes a day	Teacher's use of the curriculum is influenced by having less than 60 minutes everyday to teach math.
	Rationale Pacing	Teacher's use of curriculum is influenced by the time it takes to do a lesson, unit, or activity in relationship to where the class is compared to the OMS pacing guide
	Rationale Feel I have to	Teacher's use of curriculum is influenced by perceived pressure to use or follow it a certain way
	Rationale Class size	Teacher's use of curriculum is influenced by class size
	Rationale Missing materials/manipulatives	Teacher's use of curriculum is influenced by missing materials or manipulatives for part or all of lesson/unit
School context and Information sources		
	Years of experience: Years teaching	Number of years teaching. Self reported by teacher from short background survey.
	Years of experience: Years teaching at current school	Number of years teaching at current school. Self reported by teacher from short background survey.

	Years of experience: Years teaching using current CMSI supported math curriculum	Number of years teaching using current CMSI supported math curriculum. Self reported by teacher from short background survey.
	Combination of years teachers and years teaching curriculum	Calculated variable that groups teachers into 18 categories with teachers who have been teaching less than 5 years total and more than 5 years total crossed by number of years with math curriculum
	Attendance at CMSI professional development	Did teacher attend any professional development in math either during the summer or school year for new users, experienced users. Self reported by teacher from short background survey.
	Endorsement status: Have math endorsement	Is teacher endorsed in math. Self reported by teacher from short background survey.
	Endorsement status: Enrolled in CMSI supported math endorsement program	Is teacher taking classes toward endorsement. Self reported by teacher from short background survey.
	Primary grade teacher	Grades K through 5 teachers, not including those teaching special education or English language learners. Self reported by teacher from short background survey.
	Middle grade teacher	Grades 6 through 8 teachers, not including those teaching special education or English language learners. Self reported by teacher from short background survey.
	Teacher of special education students	Teachers teaching special education students. Self reported by teacher from short background survey.
	Teacher of English language learners	Teachers teaching English language learners. Self reported by teacher from short background survey.
	School's adopted CMSI supported math curriculum	Evaluation team report of case study school's use of Everyday Math or Math Trailblazers and Connected Math or Math Thematics.
	School status as voluntary or mandatory CMSI implementer	Evaluation team report of case study school's status as entry as a user of CMSI math curricula.
	School's number of visits by OMS instructional leaders	Evaluation team count of number of OMS instructional leader visits included in OMS Visitation Log.
	School's presence of math specialist	Evaluation team report of case study school's presence of a math specialist.

Analytic Strategies

In this section we describe how we analyzed findings based on the coding of data using the categories and subcategories described above. We then explain our efforts to deepen our understanding of emerging patterns of use by exploring relationships between use and rationale, in terms of relevant contexts and information sources.

We made the choice of conducting focus groups because they provided us with self-reports of teachers regarding their use (or non-use) of the curriculum and reasons for particular kinds of use and other math instructional practices; it also afforded us the opportunity to witness teachers engaged collectively in sense-making around the curriculum. This provided initial data about the ways in which teachers may or may not influence each other; it allowed us to witness instances in which teachers came together around shared beliefs about the curriculum or sustained divergent views of the curriculum—and to learn whether these shared or divergent beliefs relate to similarities or differences in their practices. Further, given the need to conduct this evaluation work in a short period of time with available resources, focus groups were chosen because of their advantages in gathering information from a larger number of teachers in a shorter period of time. We recognize that focus group data may not act as the perfect vehicle for this analysis as this report rests on an analysis of what individual teachers reported. However, it has proven to be a very rich source for understanding teacher's individual views, even if not as rich as individual interviews would have been.

Analyses included in this report were conducted by the same evaluation team members who also collected the data in the schools. The analysis proceeded along the following steps:

1. Analysts transcribed the focus groups they conducted.

2. The focus group transcripts were compiled. Four analysts then read through a subset of the transcripts. Each took a different group split along the lines of who used Everyday Math vs. Math Trailblazers vs. Math Thematics vs. Connected Math.
3. The evaluation team convened and generated a list of all ways that the teachers spoke (1) about using the math curricula and (2) about rationale they had that related to their teaching experiences. This facet of the analysis gave no evidence that teachers in the different curriculum groups reported substantially different uses and rationales.
4. Using the generated list of uses and rationales, the analysts next each took subsets of transcripts grouped by school. These were read closely and coded by uses and rationales.
5. The convened analysis group discussed their preliminary examination of the codes. They determined that that the codes needed to be refined and did so.
6. The school by school transcript groups were then revisited and each teacher was coded again with the revised codes. The codes per teacher were then entered into a SPSS database. The codes used at this teacher level are defined and included in the Appendix. The variables used for statistical analysis are also summarized in the Table above in order to show how they match up with the theoretical framework described in the previous section.
7. Descriptive and comparative statistics were then run.
8. Statistical findings were discussed by the convened evaluation team. Needed qualitative analysis of some facets of the transcripts were identified and conducted.
9. Evaluators examined observations and follow up briefings for data that confirmed/disconfirmed patterns found in the focus group transcripts.

4. FINDINGS

The findings reported on below are part of an ongoing examination of CPS teachers using CMSI supported curricula. They offer our best understanding of how teachers talk about using the curricula and what issues are salient to their choices around using these curricula. In this section, we first offer a brief summary of findings and then delve into detail about the evidence supporting these findings.

Overview of Findings

Teachers talked about many issues impacting their teaching but expressions of views of their students and of the math curricula packages were the most prevalent. In this report we elaborate on and make categorical distinctions regarding how teachers talked about students and curricula. In terms of students, rationale subcategories included: students' socioeconomic status, aptitudes, prior exposure to the curriculum, and behavior. In terms of curriculum, rationale subcategories included how teachers saw the materials as: including practice of rote problems, teaching basic skills, being hands-on, being literature-based, being demanding.

Almost all teachers reported using the CMSI supported math curricula that their school adopted. However, most described their use in ways that differed from a process that solely followed the text and directions provided. Most supplemented, modified and/or skipped over parts of their lessons from the CMSI supported curricula. Supplementing was the most common variation on their teaching, with a majority of teachers supplementing with outside curricular materials they acquired from other sources or that they created. Often their rationale for this kind of supplementing was to give students more basic math skills practice. Teachers also left out parts of lessons and modified the lessons (often by altering the time spent on different sections). A few teachers reported using the curriculum as the authors of the materials suggested, without altering it or supplementing with other materials.

Teachers with all different types of professional experience expressed similar perspectives about how they teach math using the CMSI curricula. There was no evidence that they were influenced by their overall number of years teaching, years teaching at their current school, years teaching the CMSI curriculum, math endorsement status, whether they were currently enrolled in an endorsement program, the grade level at which they were teaching or if they were teaching students with exceptionalities such as students with disabilities and ELL learners.

In comparison, teachers who did not go to professional development workshops, when compared to those who attended CMSI professional development, were more likely to report that they supplemented their math lessons with material outside of the CMSI supported curriculum they were using.

Teachers' reported use did not vary in statistically significant ways when analyzed in terms of key aspects of the school context that pertain to implementation of CMSI-supported curricula. Reports of curriculum use were similar for teachers

regardless of which CMSI-supported curricula were used at their school, and regardless of whether their schools was mandated to use CMSI supported math curricula or did so voluntarily.

Another contextual factor considered was that of school support of curricular instruction, in the form of visits by an OMS/Area specialist or the presence of a school-based specialist. There was no meaningful correlation between the number of times an OMS/Area instructional leader visited the school and the nature teachers' use, except for a reported decrease in supplementing of the curriculum with an increased number of OMS/Area specialist visits (from 8 visits to 23 visits). We also found that in schools without a school-based specialist, teachers were more likely to report leaving out something in the curriculum -- for instance, games, parts or whole lessons.

The remainder of this section looks more closely at these findings. We describe in detail statistical analyses that examine the prevalence of teacher reports of their use of curricula. We also include findings from qualitative analyses that illustrate some of the more prevalent patterns and nuanced descriptions of how teachers make sense of their math teaching using the CMSI supported curricula.

Detailed Findings

Primary Rationales for Teaching Choices: Of the rationales teachers discussed during focus group dialogue around their use of CMSI supported math curriculum, the most prevalent rationales break down as follows:

47% of the teachers talked about students and their needs

37% of the teachers talked about the math curriculum and its features

22% of the teachers talked about ISAT and its features

15% of the teachers talked about how difficult it was to keep pace with the curriculum pacing guide

In this section, we divide the two most prevalent rationales—students and curriculum—into more nuanced sub-categories. Under each sub-category we include examples from teacher focus groups and observation debriefs that are representative of our findings across the sample groups. The sub-categories represent some of the ways teachers explain or rationalize particular kinds of curriculum use. Often examples that fit more than one sub-category, but we discuss them in light of the sub-category they are placed and refer to some in other sub-categories. It is also important to note that in instances when teachers' rationales are fairly evenly split between teachers providing both rationales for or against something (e.g. "hands-on activities are great," and "hands-on activities are confusing"), we provide examples of both prevalent rationales. Instances where examples are more one-sided are not necessarily reflective of a total absence of the opposing view, but are representative of the general consensus across the sample groups.

Student Traits: The most prevalent category teachers describe or refer to in rationalizing or explaining particular kinds of curriculum use is *Student Traits*. This main rationale category is broken into four sub-categories that reflect the traits that most influence choices teachers make in their curriculum use. These subcategories are students': socioeconomic status, aptitudes, prior exposure to or familiarity with the curriculum, and behavior. These sub-categories are described and illustrated below:

- Students' socio-economic status: Teachers alluded [alluded or referred? So are we inferring this from what the teachers said? If so, we might way they alluded to some facet of their students' socioeconomic status] to students' socioeconomic status as a factor that affected students' understanding of and/or ability to learn using the CMSI curricula.

Example:

Teachers in one focus group talked about the difficulty the students had with learning the lattice multiplication and how they used the internet to find out more about it. They noted that while teachers had access to the internet to do this kind of a search on this method of multiplication, many of their students and their parents would not have access to this necessary resource for gathering of background information in order to learn/apply the method.

Teacher 1: They do touch on the partial multiplication. I never learned it that way, but I have the resources, and the reality of the situation is, for the children here, is they don't have the internet at home.

Researcher: So the resources cut into the program?

Teacher 1: Well, just being able to go out and say how do I do the all partials method multiplication.

Teacher 2: We did the lattice multiplication last year and I had to find a website that explained it. And it's not related to the curriculum—it was on the internet. I guess other people didn't know how to do it either because it was on the internet. Like I said, I have all of the teachers in math so I can call [them], but a lot of these children when they get home, first of all, they are on their own doing their homework. Second of all, if their parents are trying to help them, and they don't know how to do it, they don't have the resources to go to, and then the kids have to figure things out, and it's just not working.

- Students' Aptitudes: Teachers alluded to students' educational aptitudes or levels as factors that affected students' understanding of and/or ability to learn using the CMSI curricula.

Example:

In many instances, teachers across our focus groups spoke of students' abilities as being "low." In one kindergarten focus group, a teacher explained how students were much slower at picking up the concept of adding parts in multiple ways to make the whole. For example, what are all the combinations of pennies that can make 10? In a 6th grade focus group, a teacher remarked that she had to read the text with the students so she could explain one paragraph at a time because students were not at a 6th grade reading level. In a 3rd-5th grade focus group, teachers concurred that this CMSI curriculum could be used at a "gifted" school or in "Hyde Park" but not for their "inner city" students.

Teacher 1: I think it's a wonderful program but our children just don't function at that level

Teacher 2: Some of those lessons are good,

Teacher 3: That's true

Teacher 1: the kids can learn from some of them, but most is just too much for them.

- Students' prior exposure to or familiarity with the curriculum: Teachers referred to students' prior exposure to or familiarity with the curriculum as a factor that affected students' understanding of and/or ability to learn math using the CMSI curricula.

Examples:

Some teachers who used the curriculum in the past and whose students had experience with the curriculum in the past found that their students adjusted more easily to the curriculum in the next year. For example, one middle grade teacher explained how her students who had experience with the curriculum became accustomed to the procedures of the instruction, while students without experience were not adjusted:

Teacher: So the ones I had last year, the ones who were 7th graders are 8th graders now and the 6th graders are 7th graders now. They are accustomed now that "Oh, well, we have to read the story that will take us into the math." Where now the 6th graders who come from 5th grade, they are kind of antsy: "Well, Geeh, why does she have to read before we do the math?" They have to get accustomed to it. But the students from last year, they know that "Well, we are going to do reading first before we do the math." And it kind of sets the tone, and they are more eager now to read and try to break the story apart before starting the math. Like the newcomers, the 6th graders, they are not used to it yet. But now as the process goes on they are beginning to get in tuned to it. But it's kind of difficult for them to understand that we are going to read a story, and set the tone; that's going to take us into the math and how the math should be done. And that's something that they are not used to.

Other teachers focused on students' prior exposure to content knowledge. Discussion during one fourth grade focus group provides an example of this:

Teacher 1: The program takes for granted that the kids know, and most of the time they don't. It's based [on] you already knowing certain things. Now this year, they probably do know this. They had it in 3rd grade. I don't know if they had it last year.

Teacher 2: They didn't. I have students coming in where they were expected to know how to make graphs and if it's not done in the 3rd grade or 2nd grade... We really couldn't move on today. We spent a lot of time discussing how to make the bar graph, how to space things. Things that should have been done years ahead. I mean I would sit there; I was just like, "Oh."

- Students' Behavior: Teachers identified students' behavior as affecting their understanding of and/or ability to learn math using the CMSI curricula.

Example:

A number of teachers gave their students' behavior as a rationale for not using aspects of the curricula. In some cases teachers indicated that they didn't use manipulatives because students might throw them or build skyscrapers or put them in their mouths. Other teachers spoke of not using the pedagogy suggested by the curricula because of students' behavior. For example, some teachers said that they do not use cooperative grouping because students do not know how to sit next to each other without causing harm to others.

Curriculum. The second most prevalent category of teachers' rationales for particular kinds of curriculum use is the *Curriculum* itself. This main rationale category is broken down into five sub-categories that reflect those traits or qualities of the curriculum that most influenced the choices teachers make in their curriculum use. These sub-categories represent teachers' explicit views of the curriculum: "amount of practice of rote problems," "amount of basic skills development," "hands-on," "literature heavy," and "is demanding; requires a lot of the teachers and/or students." The five sub-categories are explained and illustrated below:

- Practice of rote problems: Teachers described and assessed the curriculum as having or not enough practice problems to ensure students' understanding.

Example:

A fourth grade teacher who used the Math Thematics curriculum in her previous teaching at the middle grade level, spoke of how that curriculum had a lot of practice problems while the fourth grade CMSI curricula did not:

The good thing about the Math Thematics though is it had a lot of practice problems for the students to do and that's what's lacking in this curriculum. I...still [have] a personal belief that it's good to do math with manipulatives and get them going in [thinking] scientifically, but I still think that they need a lot of practice problems to do it, and there's not enough. I mean, Jesus, as a kid I had 30 math problems for homework. But I think that I know my math because it was a repetition of steps to do so I don't think that they give you enough rote problems to do even though it's such a rich curriculum. I think that component needs to be in there. Traditional sort of math needs to be in there because, I figure, I believe, that to learn how to do something, you need to practice, and math is a step-by-step practice. And if you don't get the steps, you're not going to get the problem right.

- Basic skills development: Teachers described and assessed the curriculum in terms of its providing or not providing (enough) basic skills development.

Example:

The example that follows is from a focus group with K-2 teachers who took issue with the curricula for not including some "basics" in the curriculum while including other content that they considered too advanced for the age group:

Researcher: You don't feel like there is enough skill development in the curriculum?

Teacher 1: We were just talking about the fact in first grade—I don't know what they do in second grade—but they don't go over time in first grade at all. The last year we ended the program two weeks early, and I wrote a unit on time because in first grade they need that and money. Well, money in the sense of pennies [is in the curriculum] and that's it. It [the curriculum] doesn't talk about how many pennies make a nickel, you know what I mean?

Teacher 2: It doesn't break it down, but they do it in the sheet [journal/workbook] in there. But they don't really go over it.

Teacher 1: But they do volume [sarcastically]

Researcher: ...Do you find that it has—the curriculum itself—what you need to bring your kids up in math? If not, what parts do you feel are missing and how do you accommodate for that? How do you make that work so kids aren't left behind?

Teachers responded to the researcher's question by saying their kids needed the basic skills help so they supplemented the curriculum by getting things off the internet or by using basic skills sheets from their plethora of resources accumulated over their many years of teaching.

- Hands on: Teachers described and assessed the curriculum in terms of its reliance on hands-on use of manipulatives by students to promote students' understanding.

Example:

Teachers were split on the hands-on aspects of the curricula. Some found this a benefit to student learning; others a deterrent. Two examples follow.

Teacher 1: I think that this Math Trailblazers to me is not as strong as what we used to use. [Researcher: What's not as strong?] You have to have the basics to know and do this, and we don't have this in this program. The thing I like about this program is the manipulative—It gives the kids hands on and most of them benefit from that. The rest of it you can scrap, but the manipulative part of it is the best part of this program. The basic skills part is not strong enough to me and the spiraling parts are very new. Seriously new. And not enough practice, practice, repetition, repetition.

Teacher 2: I thought that Math Trailblazers had hands on activities and scientific and all of that stuff, but it's so complicated and it's so complicated it takes the fun out of it for these kids. Ok? It turns them off. They say hands-on that they need but they confuse them because it's too much.

- Literature based: Teachers made described and assessed the curriculum in terms of its basis in literature/reading..

Examples:

Teachers seemed to be divided on their sensemaking around the literature based nature of some of the curricula. Some teachers found this entry into the math content to provide helpful background for setting the stage with students. Others felt that the extensive reading was a good idea in the abstract, but was practically difficult because of the literacy abilities of their students. Yet others found this reliance on literature to be problematic as they felt this set students up for having to be good at reading comprehension to be able to "do mathematics."

- Demanding, it requires a lot of work: Teachers described and assessed the curriculum in terms of its being "demanding." By "demanding." Some teachers were referring to it being a "challenging" curriculum for students; other teachers viewed the curricula as demanding of teachers, meaning that teachers needed a lot of time and prep work to be able to do the lessons.

Examples:

In one of our upper grades focus groups, a teacher explained how the curriculum doesn't present a simple set up of a formula followed by a number of computational problems, but instead engages students in understanding the reason behind what they are doing. We use this example here to represent how this "new" style of learning is demanding of students—making them think about what they are doing and engaging them in deeper mathematical processes.

Teacher: [As if talking to students] "Okay, so how did you find circumference without understanding where pi came from?" And then in the book it had us to do the experiment where they drew a circle and cut out a line across the middle, now that line that touches both sides of the circle is the diameter. "Okay, now what does that have to do with pi? Okay, well then you take the diameter and see how many times will that fit around the outside of the circle?" And they say, "Oh, okay, well, it will go around there 3 times." "But what about this little section? Okay, then...so it's about 3 times and a little fraction over...so 3.14 that goes to infinity—the number pi." So they remember that when they do the hands on with the reading and the experiment. And then it's after, "Okay, well then what does that have to do with the circumference then? Once you find out how many times that diameter goes around the outside of a circle, but what does that have to do with the circumference?" "Oh, well, it's the left of the diameter times the number of times that it will stretch." I said, "Okay, now we got it." And as long as they can remember that we did that experiment, and we did this, then they don't need them [the formulas]—they won't necessarily need a formula [because they will understand the reasoning behind it and will be able to remember the theory/process. Thus, they won't need to memorize a formula out of context]. And they [students] can see that.

Teachers complained about the demands of the curriculum on them in terms of time involved in learning and navigating the curriculum and in presenting material to students.

Researcher: The supplementing goes back to the traditional way that doesn't have a lot of reading—that is your problem?

Teacher 1: But you still have to explain it, and the problem is some of the words that are explained in Math Trailblazers just are not known [to students or the teacher] and some of them I am like “What in God’s name is this?” and then I have to go back and say this is when you did [such and such] and you have to think back to when you learned it because even though you go to the PD it doesn’t explain every lesson. They [professional developers] will do a good job, but they don’t go through each lesson so you are on your own. But you have to follow that small book, and you have to follow the TIG. You have to follow those and read those and then it makes good from the way you learned it, and you try to present it in two or three different ways to the children because some of them get the Math Trailblazers and some get it another way. And you have to go through three different steps to teach one lesson.

Teacher 2: Even as a teacher I am learning it and making sure I understand it before we teach them, and it’s hard for some because it’s not all that teacher friendly whereas we don’t have 8 hours after we get off of work to go home and read Math Trailblazers. I think something a little more [teacher friendly like] this is what I am going to do, and this is the objective for the day. [Like a] one sentence, example and [how to] explain to the kids. Instead [the book provides] 2-6 pages of do this and this and then that and that and you have to be able to break it down for students and for yourself so we got to keep up.

Discussion Questions:

- How can the Area, OMS staff, professional development providers, university-based coaches and other partners work together to provide a consistent and clear message of the theory behind the use of these standards-based curricula such that teachers can join in the paradigm shift from repetition and rote memorization to a more constructivist view of how students learn?
- What space and time can the district and school principals build into teachers’ work days to give them the time to learn more about these curricula and the theory behind them?

Teacher Use of Curricula

How do teachers talk about their use of curricula? As mentioned in the Methods section above, we coded examples of use into five major categories: leaving out, modifying, supplementing, using as is, and never using. Since only one teacher reported never using the curricula, the data presented in this section refers to the other four facets of curriculum use.

Teachers talked about using the CMSI supported math curricula but typically using it somewhat differently than exactly as the authors of the curricula conveyed. Teachers talked in focus groups about leaving out, modifying, or supplementing the curriculum. Teachers spoke the most about supplementing the curriculum with materials from other sources.

Supplementing. How widespread is the practice of supplementing CMSI supported math lessons with outside materials and what does it look like? Sixty-six percent of the teachers talked about supplementing when they taught math. Most of those (44% of all teachers) said they supplemented by using other material that covered basic skills in math and/or offered additional practice problems for students. For example, one teacher stated that he uses the curriculum “as is” but supplements for basic skills in multiplication with non-CMSI materials.

Teacher: I do feel like I have to supplement...So what I do, on my own, is I will bring in multiplication worksheets. And I will give them one once a week--which is not what the program suggests to do. But I do that every week...And also something with subtraction and addition. I use my own sheets.

Leaving out. How widespread is the practice of leaving out parts of CMSI supported math lessons or whole lessons and what does this look like? Teachers also talked about leaving out either parts of or whole lessons in the curriculum. Forty-one percent of teachers said they left out something when they taught math. Most teachers talked about leaving out parts of lessons. Fourteen percent of teachers said they left out whole lessons. Games were one part of the lesson that teachers sometimes talked about skipping.

Teacher: We use what we can. And it’s always the fact there are a lot of games. We don’t always get to the games. So we pick and choose the most important and what we can...We try to do at least the main lesson per day.

Modifying. How widespread is the practice of modifying CMSI supported math lessons and what does it look like? Thirty-seven percent of the teachers said they modified the curriculum in some way when they taught math. Most of those (21% of all teachers) reported modifying how they used time to cover the material—either going more quickly or slowly to cover the curriculum. In the following example a teacher talks about how she modified the amount of time used to teach math. She also explains that she altered the order in which she taught the curriculum. The Daily Practice Problems (DPPs) are a part of Math Trailblazer lessons and are designed to be taught during the classroom lesson.

Teacher: I send the DPPs home for homework. So we start [the lesson in class] by checking DPPs and doing that 100s of coins data table. ... So we do that. And then we go into the main lesson, which usually takes us over an hour, hour and fifteen minutes to get it all done. So it spills over from math time to after lunch and sometimes after gym.

Using “as is.” How widespread is the practice of using CMSI supported math lessons “as is” and what does it look like? Only 17% of teachers talked about using the curriculum exactly as the authors presented it and did not mention leaving out, modifying or supplementing. Twenty-nine percent of teachers said they used the curriculum “as is” in addition to leaving out, modifying or supplementing. For example, at one school the teachers stated very clearly that they strictly followed their chosen curriculum.

Teacher 1: Well, we use Everyday Math, and we follow the curriculum basically.

Teacher 2: We don’t do any supplementing... there is enough of everything there.

Teacher 3: We are [using it] too. And what I like most about the EM program is it spirals so you are hitting stuff and you don’t have to wait a whole lot of time because you are going to come back to it. It’s not like old math where you teach something and then you don’t get back to it. So, this is how it’s set up.

Table 2: Teacher Use⁷

Teachers’ report on how they use curricula	% of Teachers
Supplementing in any way	66%
Supplementing to cover basic skills and offer more practice problems	44%
Leaving out in any way	41%
Leaving out whole lessons	14%
Modifying in any way	37%
Modifying by altering use of time	21%
Using the curriculum and not modifying, leaving out or supplementing	17%
Never using the curriculum	1%

Discussion Questions:

- How do curriculum providers, authors, and district staff make sense of these subcategories of use? For instance, is it “appropriate” for teachers to supplement, modify, or leave out lessons or parts of lessons? If so, when and how?
- Do all CMSI leaders have a shared view of these subcategories?
- What role does teacher autonomy and professional wisdom play?

Experience in the Profession as Related to Teacher Use of Curricula

We defined teacher experience broadly, as encompassing the number of years teaching overall, years teaching at the school, years teaching the curriculum, endorsement status, current enrollment in endorsement classes, and grade level. As we noted above in the discussion of the study’s analytic framework, these experiences can influence teacher practice. However,

⁷ For a closer look at these analyses, see the Technical Appendix.

when we examined how teachers in our focus groups spoke about their use of curricula and then compared groups according to their different years of experience, we did not find evidence of influence. This held true when we looked at if teachers did any types of variations on teaching the curriculum and if teachers talked about a combination of many or few types of variations in their math teaching.

Table 3: Teachers’ Use of the Curricula Related to Teacher Experience in the Profession Below we summarize some of the findings about experience in the profession as this relates to teacher use of curricula. While there are mathematical differences in measures of curricula use across different professional experience levels, in almost all cases these differences are neither meaningful nor statistically significant.

Years of experience. The number of years teachers spend teaching during their career, at their current school, or using the CMSI supported math curriculum do not relate to a teacher’s likelihood to talk about modifying, leaving out, or supplementing that they do when teaching math. Table 3 shows only small and non-significant correlations between teacher experience in the profession and how they use the curricula.

We also felt it was important to understand the relationship between teachers’ teaching experience compared to teacher curricular experience since there are both teachers with lots of teaching experience and curriculum experience and teachers with lots of teaching experience but not much curriculum experience. We chose to represent teachers with less overall teaching experience if they had been teaching for five years or less and teachers with more overall teaching experience if they had been teaching for more than five years. See Table 4 for the number of teachers in each level of experience.

Table 4: Less and More Overall Years of Teaching and Years Teaching Curriculum⁸

	Less Overall Years Teaching – (less than 5 years)	More Overall Years Teaching – (more than 5 years)
Taught Curriculum less than 1 year	7 (35%)	7 (11%)
Taught Curriculum 1 year	6 (30%)	9 (14%)
Taught Curriculum 2 years	2 (10%)	13 (20%)
Taught Curriculum 3 years	4 (20%)	20 (31%)
Taught Curriculum 4 years	0 (0%)	9 (14%)
Taught Curriculum 5 years or more	1 (5%)	6 (9%)

A new variable was created to represent the combination of years of teaching and teaching the curriculum for each teacher. This offered a way to distinguish between teachers who have taught the curriculum for many years with lots of teaching experience, teachers who have taught the curriculum for few years with not much teaching experience. However, even given this more nuanced measure of teacher professional experience, there were no relationships with reported curriculum use.

Endorsement status. Endorsement status (i.e., current or future) does not relate to different types of curriculum use. The number of teacher in our sample that were endorsed or in endorsement programs is small—just 22% and 12% respectively. While the percentages of teachers who talked about different ways of using curriculum may look slightly different between endorsed and endorsement-seeking and other teachers, the findings do not offer compelling evidence to suggest any differences between these groups of teachers.

Elementary and middle school teachers. Middle grades and primary level teachers showed no meaningful differences between each other in terms of how they talked about using the curricula. The small differences in percentages from the two groups of teachers who reported various practices were not statistically significant.

Teachers who teach students with exceptionalities. Teachers of special education students or English Language learners reported using the curriculum in the same ways as other teachers. There was no statistically significant difference between how special education teachers talked about their use of curriculum in terms of leaving parts out, modifying, or supplementing, and how all other teachers talked about their use. Because the number of special education teachers in the sample was very small (just 10%) this analysis should not be interpreted as providing meaningful evidence as to whether special education teacher differ from or mirror the rest of the sample in terms of use of curricula. The same holds true for the analysis of the 7% of teachers in our sample who teach English Language Learners.

Discussion Questions:

⁸ For a closer look at these analyses, see the Technical Appendix.

- What if anything is surprising in these findings?
- What are the possible reasons for these differences or lack there of?
- What message does OMS want to give to these teachers regarding their use of CMSI curricula?
- Is that message being received or not?
- After all these years of teachers using CMSI supported materials, what supports can OMS or the district provide to best encourage teachers/principals/schools to receive and act on the OMS/CMSI message?

Table 3: Teachers' Use of the Curricula Related to Teacher Experience in the Profession⁹

	Years teaching (correlation)	Years teaching at school (correlation)	Years teaching this curriculum (correlation)	Total sample of teachers (Percent of teachers)	Endorsed in math (Percent of teachers)	Enrolled in endorsement program (Percent of teachers)		Primary grades teachers (K-5) (Percent of teachers)	Middle grades teachers (6-8) (Percent of teachers)		Sp Ed teachers (Percent of teachers)	English Language Learners teachers (Percent of teachers)
Teacher reports ANY modifying	-.125	.009	.029	37%	69%	33%		38%	38%		50%	33%
Teacher reports ANY leaving out	-.066	.177	.032	41%	60%	29%		43%	50%		50%	14%
Teacher reports ANY supplementing	-.132	.099	.135	66%	27%	43%		67%	60%		67%	43%

⁹ For a closer look at these analyses, see the Technical Appendix.

Attendance at Professional Development as Related to Teacher Use of Curricula

Teacher attendance in OMS professional development workshops on the CMSI supported math curricula, in contrast to the above professional experiences of teachers, may relate to how teachers use the curricula. The differences between professional development attendees and non-attendees in terms of how teachers talked about leaving out or modifying part of the curriculum were statistically significant, but not large enough for us to suggest any meaningful difference. However, while most teachers supplemented the CMSI supported curricula, those who did not attend professional development were more likely to supplement than those who did. The difference between 79% of the non-attendees talking about supplementing and 61% of the attendees talking about supplementing was both meaningful and statistically significant.

Table 5: Teacher Use and Professional Development Attendance¹⁰ **

	Leave out – Any part of curriculum	Modify – Any part of the curriculum	Supplement – In any fashion
Attended some CMSI professional development	41%	37%	61%
Did not attend CMSI professional development	39%	39%	79%

** The differences between professional development attendees and non-attendees in terms of these measures of curriculum use are all statistically significant at the 0.01 level.

Discussion Questions:

- What messages are teachers at professional development hearing about supplementing, modifying, and leaving out?
- How are these messages being conveyed to the wider CMSI audience? Principals? Specialists? Area and OMS staff? University coaches?

School Context as Related to Teacher Use of Curricula

Since teachers in our sample work in very different school environments, we felt that it was important to understand the nature of curriculum use for teachers from schools that used different CMSI supported math curricula, from schools that were mandated to use CMSI supported math curricula vs. schools that did so voluntarily, from schools with school-based specialists vs. schools without, and from schools that differed in terms of how many visits they received from OMS instructional leaders during the 2006-07 school year.

School's adopted CMSI supported math curricula. Teachers reported use did not vary in statistically significant ways for different math curricula user groups.

¹⁰ For a closer look at these analyses, see the Technical Appendix.

Table 6: Teacher Use and School’s Adopted CMSI Supported Math Curriculum ¹¹

	Total sample of teachers (Percent of teachers)	Everyday Math	Math Trailblazers	Connected Math	Math Thematics
Teacher reports ANY supplementing	66%	69%	74%	58%	67%
Teacher reports ANY modifying	37%	41%	45%	36%	22%
Teacher reports ANY leaving out	41%	41%	39%	17%	70%

School status as voluntary or mandatory CMSI implementer. Teachers reported use did not vary in statistically significant ways for teachers in voluntary implementing schools compared to mandatory implementing schools when we looked at whether teachers left out parts of the curriculum or modified it or supplemented with outside materials. However, in voluntarily implementing schools, teachers were more likely to adapt their use of CMSI curriculum by combining leaving out, modification and supplementing strategies than did their colleagues in mandatory implementing schools. .

Table 7: Teacher Use and School Status as Voluntary or Mandatory CMSI Implementer¹²

	Leave out – Any part of curriculum	Modify – Any part of the curriculum	Supplement – In any fashion
Voluntary	45%	41%	71%
Mandatory	33%	29%	58%

School’s number of visits by district instructional leaders. As a method to support math instruction in the Chicago Public Schools, the OMS has Citywide Specialists, Facilitators, Area Math and Science Coaches and other personnel who go into the schools. The following table illustrates differences in how teachers’ schools were visited and how that may relate to how teachers use the curriculum. The analysis looks at differences in the number of visits made by OMS personnel in 2005-06. While there is a large percentage of teachers supplementing in the schools getting a mid range number of visits, there does not seem to be a discernable pattern between visits and teachers’ use of curricula.

¹¹ For a closer look at these analyses, see the Technical Appendix.

¹² For a closer look at these analyses, see the Technical Appendix.

Table 8: Teacher Use and OMS Visits to their Schools¹³

	Total sample of teachers (Percent of teachers)	0 OMS Visits	1 -8 OMS Visits	9 or more OMS Visits
Teacher reports ANY supplementing	66%	54%	80%	50%
Teacher reports ANY modifying	37%	58%	31%	40%
Teacher reports ANY leaving out	41%	43%	32%	43%

School's presence of a math specialist. The following table illustrates differences in how a teacher being at with a specialist may have related to how teachers use the curriculum. The analysis looks at specialists' presence in 2006-07. In schools without a school-based specialist, teachers are more likely to leave out something in the curriculum, for instance, games, parts or whole lessons. In other words, 57% of teachers at schools without math specialists left out parts of the curricula but in schools with math specialists only 26% of the teachers left out parts of the curricula.

Table 9: Teacher Use and Presence of School-based¹⁴ Math Specialist¹⁵

	Total sample of teachers (Percent of teachers)	Have School-based Math Specialist	Do Not have School-based Math Specialist
Teacher reports ANY supplementing	67%	76%	58%
Teacher reports ANY modifying	37%	32%	43%
Teacher reports ANY leaving out	41%	26%	57%

Discussion Questions:

- What's surprising about these findings?
- Based on the above findings, what personnel supports seem to make a difference in how teachers use CMSI curricula?
- What additional supports are needed?
- What sources of information might provide a clearer understanding of the effects of the school context on teachers' use?

¹³ For a closer look at these analyses, see the Technical Appendix

¹⁴ School-based specialists include part time and full time designated specialist at the school. Citywide Specialists are included here as school-based for purposes of this comparison.

¹⁵ For a closer look at these analyses, see the Technical Appendix