

**Interim Evaluation Report:
CMSI/CUSP Elementary School Development, 2003-2004**

**Report D: Exploring Implementation--
Intensive Support & Readiness School Stories**

A report to the
Chicago Public Schools
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The conclusions drawn in this report reflect the viewpoint of the authors. While there are many potential viewpoints with respect to a given program, one way to facilitate improvement is through open discussions of such differing opinions within the context of data-based reporting.

Abstract

In this series of reports, we focus on the Chicago Public Schools' Office of Mathematics and Science (OMS) Elementary School Initiative of the CMSI (Chicago Math Science Initiative). This initiative was pursued in part with the support of the National Science Foundation funded Chicago Urban Systemic Program (CUSP). In particular we present descriptive and analytical findings from the first full year of implementation of the CMSI during the 2003-04 school year. The findings about implementation are divided into four reports. *Report A* provides the context for the Initiative, the evaluation and the data collection. *Report B* focuses on the role of the Intensive Support school Specialist. *Report C* presents the professional development and showcases offered by OMS and TAMS. *Report D* describes early stories of CMSI implementation in several Intensive Support and Readiness case study schools.

In this section, Report D, we focus on the state of implementation in case study Intensive Support and Readiness schools in 2003-04. Analysis of case study data allows for the categorization of schools by early indications of successes and challenges. Supports and barriers to success are then deciphered. Variables clustered into categories of general school background, workforce development and school infrastructure and culture appear to be significant supports to the success of implementation in Intensive Support schools. For Readiness schools, analysis indicates that school infrastructure and culture, knowledge of and commitment to CMSI, professional development, and teacher leadership were supports of implementation. Finally, this report offers implications and recommendations on how to improve the spread, depth, ownership and sustainability of the elementary school efforts of the CMSI.

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Intensive Support & Readiness School Stories**

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Report D Executive Summary

This report offers findings around questions related to how CMSI elementary schools implement the OMS-supported curricular materials. Specifically, this report addresses questions of:

- To what extent have the recommended CMSI practices been adopted and implemented in schools?
- How variable was the implementation across teachers and schools?
- By what processes did school development take place in these schools?
What supported or impeded development?

Across the 9 Intensive Support case study schools in our sample, all schools had adopted the CMSI curricula and had a full-time Specialists. More than half of these schools chose to have all teachers use the curricula, rather than only the 10 or so teachers that that OMS suggested as First Wave implementers. Not all of the schools were able to set up schedules for teachers that included both a full and contiguous 60 minutes a day for math and a common prep period for all grade-level teachers.

How schools and teachers implemented CMSI curricula varied. While most schools had at least one resistant teacher among those who were supposed to implement the new curricula, there were a few schools where no teachers refused to use the curricula. In all but one school, even the teachers working hard to use the CMSI curricula were supplementing the curricula with outside materials—typically traditional test prep materials. Within schools, we heard of teachers ranging from those struggling greatly with the new curricula and teaching strategies to those who were doing such a exemplary job that curricula specialists asked to video tape that teacher’s classroom.

While there were many processes and factors influencing the success of schools’ implementation of CMSI curricula, there appeared to be some conditions more common in schools which were finding relatively more success than others. The schools more likely to be experiencing successes in implementation were more likely to have some teachers with experience teaching the curricula, positive experiences with professional development both within and outside of their classroom, strong principal support for the CMSI, some teachers serving as teacher-leaders, a school community with trusting relationships, and a good “fit” between the school and the Initiative.

In addition this report begins to offer insights into a larger question of the evaluation about if strong implementing schools, more so than other schools, found improved student achievement and has stronger school infrastructures and cultures. Based on our case studies we found that the stronger implementation schools (that we call “finding successes” schools) both related positively with improved student achievement on the ISAT and related positively with the school having important supports like strong principal support, strong trusting professional community, high quality professional development and coherence between CMSI and the broader school context. These relationships were not shown to be causal nor do we know if schools beyond our case studies showed these patterns. However, there was enough evidence and enough similarity between case students and the population to suggest that further study may show that the stronger implementing schools improve student achievement and cause or are caused by strong facets of the school organization and culture.

Finally, this report offers implications and recommendations on how to improve the spread, depth, ownership and sustainability of the CMSI.

Spread

- Provide high quality curriculum training for new implementing teachers
- Provide and offer incentives for CMSI principals to receive training in the curricula at their school
- Provide additional curriculum training for Specialists
- Continue role development training for Specialists
- Provide high quality continuing curriculum training for First Wave teachers

Depth

- Conduct brainstorming sessions with professional development providers, vendors, principals, teachers and Specialists, about the continuing professional development needs of these groups

- Create flexible and evolving structures and incentives for professional development that address expressed teacher, Specialist and principal needs

Ownership

- Conduct a strategic planning session to consider creative ways school have and might foster their First Wave teachers' abilities to mentor new implementing teachers—and then share findings and recommendations
- Reconfirm the importance of common grade level prep periods as occasions of developing a strong supportive teaching community

Sustainability

- Continue supporting strong outside hands-on support to schools by OMS Facilitators, Area Coaches and other curriculum team members so that through their mentoring schools develop long-lasting structures within
- Strategically plan how to support schools beyond the second year of implementation
- Monitor the perception of the CMSI by administrators and teachers and develop CPS district leadership strategies to avoid short term approaches to an initiative that needs a long term plan for support

Introduction

Report D is the final section in the series of reports on the implementation of CMSI during its first full year. Here we go to the heart of CMSI and look at what is happening in the schools themselves and to what extent the Initiative touches the instructional practices of teachers and, most importantly, the learning of math and science on the part of students. The foci of the other reports in this series, the Specialist role and the professional development offerings, are only worthwhile in as far as they support deep changes in the schools and in the ways teachers think about and engage in teaching math and science; and that these result in the opening of the minds of students in new and productive ways.

While getting at the extent of changes in the way CMSI teachers teach and the way CMSI students learn is essential to understanding the effects of the Initiative, these changes are the most difficult to document and analyze. Schools are organizations with complex cultures and actors have multiple perspectives on, and interpretations of, the school story. Tides of political change pound schools from many directions at times forcing drastic change (Cibulka et al, 1991). At the same time, strong traditional images of what schools should “look like” make them organizations resistant to change (Tyack, 1995).

It is with great respect for this complex context that we tell our stories of implementation. We recognize that we have only one year of data on which to tell the stories of the 12 schools that appear in this report. To truly tell the story of these schools would take far more data collection. At the same time, we feel confident in the accuracy and depth of the data we *have* collected—our researchers were careful, thoughtful and thorough in their investigation and reporting.¹

As a result, we tell our stories in brief vignette form, highlighting the basics of the school story, and drawing out the early lessons that they tell us with a realization that there is still much to learn. In this report, we utilize the stories to look for *types* of school development stories, allowing us to draw comparisons across schools on broad themes. In future work, as more data is collected, more detailed case studies will be developed that consider the individual school more carefully.²

We structure this section by first examining the Intensive Support schools and then Readiness Schools. After sharing short descriptions of each school we then discuss some of the issues they bring to light around the issues framed in our evaluation questions:

- To what extent have the recommended CMSI practices been adopted and implemented in schools?
- How variable was the implementation across teachers and schools?
- By what processes did school development take place in these schools? What supported or impeded development?

At the end of this report, we look at the state of the case study schools at the end of the 2003-2004 school year and then consider conclusions and implications.

Intensive Support Schools

Based on in-depth data collected at 9 case study Intensive Support schools (6 Math and 3 Science), the implementation of CMSI curricula and policies was pursued with vigor, finding some successes, but also finding some setbacks.³ Here we offer the vignettes and group them according to broad categories.

The first category is whether or not the school is attempting “full implementation” of the CMSI curricula or the CMSI recommended “phased-in” implementation. The CMSI recommendation for Intensive Support schools was to support approximately 10 teachers per school as “First Wave” teachers and then phase in more teachers in the second year to

¹ Detail on the research design that undergirds this report are found in Report A: Data, Methods & Overview.

² Throughout this report, when we refer to an individual school, administrator or teacher we use pseudonyms so to maintain the anonymity of those involved. We also may change some details and descriptions to further obscure the identities of schools or individuals.

³ Our study began in fall 2003 with 11 chosen case study Intensive Support schools. At one of these schools, we were not able to collect enough data to understand the situation at the school, despite repeated attempts. At the other school, we were able to collect information from the principal and teachers but not the Specialist. Given the key role of the Specialist, even with some understanding of the school, we do not include this school as one of our cases in the cross-case comparative study.

scale up to full school implementation. However, of our 9 case studies, 6 chose to go to full implementation immediately in 2003-2004.

The second category is the researchers' rough assessment of whether the experiences of the school included more successful activities than challenges (the "finding successes" schools) or more challenges than successes (the "facing challenges" schools). It should be noted that each school in our sample has both positive and negative indicators of how implementation is unfolding. We organize the cases and their indication of supports and barriers only to consider themes, not to categorize schools as "good" or "bad." We take from their experiences lessons to be learned while respecting the difficulty of the process in which they are engaged.

This categorization of schools was made in early July 2004 based on the case study data including interviews with Specialists and principals, focus groups with teachers, shadowing of Specialists and review of school documents. The categorizations were made based on a holistic assessment of the schools' experiences in implementing the new curriculum according to some of the themes we describe later in depth including teachers' resistance to teaching, concerns about pacing and critiques of curriculum.

Table D-1: Intensive Support Case Study Schools, 2003-2004
--Grouped by Broad Categories Related to Implementation

	Full-school implementation	Phased in-school implementation
"Finding successes"	Child Chawla Lange	Makeba Ebadi Ocampo
"Facing challenges"	Stanton Mead	Goodall

Table D-1 offers a quick look at how our cases align according to these categories.⁴

- *"Finding successes" with full-school implementation.* Three schools are "walking the walk" in terms of implementation of the CMSI.
- *"Finding successes" with phased-in school implementation.* Three schools are making progress with First Wave teachers and will begin implementation in 2004-05 with Second Wave teachers.
- *"Facing challenges" with full-school implementation.* Two schools are attempting full school implementation and have met some major challenges.
- *"Facing challenges" with phased-in school implementation.* One school is implementing with the First Wave teachers and has met some significant challenges.

These categorizations were not based on student achievement outcomes. However, the 2004 ISAT data (preliminary data available early August 2004) triangulates well with our categorizations of relative success for these case schools during 2003-2004. As Table D-2 shows, the three schools that we consider most challenged in terms of implementation also had declining scores in their students' performance on the ISAT between 2003 and 2004, whereas schools that we noted as more successful all had overall improvement in ISAT scores between 2003 and 2004. Achievement on ITBS math scores at these schools did not share this pattern.

⁴ It is important to note that these numbers of schools "finding success" versus those "facing challenges" cannot be interpreted as representative of the percentages of CMSI schools with these experiences. Although we selected schools in our sample to be fairly representative of CMSI schools (see Section A for sample selection procedures) the representation is not "statistical". In addition, we were unable to collect full data on two schools, suggesting that they may have fallen in either "finding successes" or "facing challenges", changing the proportion of case study schools in each category.

**Table D-2: Descriptive Grid of 9 Intensive Support Case Study Schools
—Looking for Patterns of Student Achievement Related to Implementation**

	Schools “Facing challenges”			Schools “Finding successes”					
	Stanton	Mead	Goodall	Chawla	Lange	Child	Ebadi	Makeba	Ocampo
Student Achievement									
Change from 2003 to 2004 in Gr 3-8 Math ITBS At and Above Norm	down	down	down	up	down	down	down	up	down
Change from 2003 to 2004 in overall ISAT Comprehensive Meet/Exceed Norm and on at least 2 of 3 grades (of gr. 3, 5, 8) for IS Math Schools or both grades 4 and 7 for IS Science Schools	down	down up in both gr 3 & 7 sci	down	up	up	up	up	up	up down gr 4 up gr 7s
Change from 2002 to 2003 in overall ISAT Comprehensive Meet/Exceed Norm and on at least 2 of 3 grades (of gr. 3, 5, 8) for IS Math Schools or both grades 4 and 7 for IS Science Schools	up (comp) down in 2 of 3 grades	down	up	down	down	up	down	up	up

Descriptive Vignettes of Intensive Support Schools

This section offers short vignettes describing the story of implementation at these schools. Schools finding more success are described first followed by the schools experiencing more difficult challenges to their implementation.⁵

Success with full-school implementation.

Julia Child Elementary

At Julia Child, an Intensive Support math school, the principal was an experienced leader who was new at the school. He made the decision that the CMSI was a good opportunity to improve math achievement of students—around half of whom were at or above average on the ITBS math exam. He and one teacher picked the curricula and then he hired someone from outside the school as a Specialist. There was funding in the budget for new texts and he decided to go to full implementation in 2003-04. The Specialist was not sure this was better than a more measured phased-in approach, but she supported the principal wholeheartedly nonetheless.

Child’s commitment to the faithful implementation of the math curriculum was evident in resource allocation, both monetary and time. The school came up with a creative way to schedule so that all students got one hour of math, even in the departmentalized grades, by having different passing periods for students in different grades. Common preparation periods were also created for all grades to allow for teachers to work together on implementation issues. Teachers at Child raved about the level of support they have received from their Specialist, who one teacher claims was “unfathomable” in terms of how helpful and energetic she was.

Teachers were implementing the curricula at varying levels. According to the Specialist, teachers who received OMS training on curricula implementation experienced less difficulty. However, even at the one grade level where the teachers met weekly after school, both First and Second Wave teachers explained that implementing the new curriculum was difficult and initially overwhelming to them. Some of them were emphatic about staying on pace with their teaching, but others were concerned about having the students ready for standardized testing. The principal and Specialist knew of a handful of teachers who were covertly using their old texts and not the new curricula—they planned to remove the old

⁵ In this report, real school names are not utilized to protect confidentiality promised to case study schools. The pseudonyms assigned are famous women. A complete list of the pseudonym names of our case study schools is included in the appendix of Report A.

texts from the school during the summer. The Specialist and principal were very concerned about training and support for the teachers who had not been trained in the First Wave. Would they receive the support they needed? In spring 2004, the Specialist noted, “How is CPS going to accommodate the implementation of everybody in the school when only one-fourth of the teachers are doing it now? I’m a little nervous that this hasn’t been thought out clearly.”

At the end of their first year at full implementation, Child Elementary appeared to be a story of positive implementation even if some of the teaching was uneven. Teachers were expressing some confidence in their ability to use the curricula. The principal came up with funds to keep the Specialist next year despite CPS budget cuts that eliminated OMS funding for half of her position. The Specialist worked with other leaders at the school and came up with creative ways to pay for the consumable supplies she needed for 2004-2005. The 2004-2005 training of the teachers who did not receive training last year will be a crucial element of Child’s continued story.

Dorothea Lange Elementary

In Dorothea Lange, an Intensive Support math school, teachers were struggling with full school implementation of the new curricula but were also giving it an honest effort. The Specialist described teachers as having varied responses to the curricula: one day loving it and the next struggling with it.

Three days later they’re [the teachers] ready to throw the book out of the window because it’s like ‘This isn’t what I want it to do.’ And then three days later ‘This is perfect. I want to keep going with it.’ It’s the whole spiral curriculum that the teachers have to grasp on to. They know it’s going to take some time and they’re willing to work with it.

The Specialist identified two issues the teachers were having with implementing the new curriculum. In the first place, several strong teachers were already doing some innovative things and implementing the new curriculum meant stopping some of that. In the second, the learning curve of teachers implementing the curriculum, the challenge of pacing it according to program guidelines and a lack of trust in spiraling, left school actors concerned whether students would be ready for standardized testing. The principal wondered, “Are the teachers moving in such a way that by the time the test comes, their children will be ready to take the test?”

Negative and positive indicators of the success of implementation come from data collected at Lange. In some cases the Specialist would allow the strong teachers to deviate from the prescribed curriculum as long as they met the required state standards, indicating a potential problem with the integrity of implementation. In addition, Lange was one of the CMSI schools that lost 50% of its funding for the Specialist position. At the last data collection point in June, it was still unclear if the entire position would be funded in the next year and from what sources. Given the high level of delegation the principal gave to the Specialist at this school—At one point the principal stated that “outside of occasional observations, mostly I depend on [the Specialist] to make sure everything is covered”—the loss of this position would be a crucial blow to the success of implementation at Lange.

On the positive side, some teachers were very excited about the materials and were thrilled with the summer training as well as the ongoing training, which may indicate a growing commitment to the curriculum. Observations during Specialist shadowing revealed First Wave classrooms alive with the math curriculum. For example, in one classroom, students were working in pairs on a math assessment, helping one another to study and correct mistakes after the individual assessment. In the 2nd grade classroom, students were observed discussing their different approaches to solving the same addition and subtraction problems. In the kindergarten room, students were comparing the weights of a teddy bear, a toy car and an egg using a balance. In the 4th grade, students were trying on understanding how to measure the volume of various objects. At the end of class, the teacher asked the students, “How would you find the volume of an elephant?” and they were able to make good conjectures. This excitement and enthusiasm is the positive side of implementation at Lange.

During the 2003-04 school year, teachers at Lange were seen working hard to implement the math curriculum. Students were observed engaging in and gaining from the use of the materials. Questions of the sustainability of the implementation were primarily focused on school leadership. High levels of concern existed at Lange about pacing and the need to cover the material necessary for students to do well on standardized tests. At the same time, the Specialist and principal were sympathetic to teachers who were considered to be “good” who wanted to continue to use their own ways of presenting lessons other than what the CMSI curriculum suggested. Supports to implementation at Lange appear to be teacher engagement in attempting to implement and student success with the approach. Barriers are focuses on student test scores and a desire for immediate results in pacing the curriculum on the part of the principal.

Kalpana Chawla Elementary

Kalpana Chawla Elementary applied for Intensive Support status in math because the principal was convinced that the CMSI curricula would be good for students and urged the LSC to support the full implementation. More than the designated First Wave teachers participated in summer 2003 professional development. The OMS Facilitator and the Specialist early in the 2003-2004 school year offered at-school training in the curricula. All teachers implementing the curricula participated in vendor-provided curricula workshops throughout the school year.

There seemed to be positive but measured movement in how teachers felt about the curricula implementation. In October, a number of teachers commented on the difficulty they were having adjusting to the many facets of the new curriculum. By late January, our researcher noted the depth of 3 teachers' implementation of the curriculum in their classrooms and wondered if this depth was evident in the other classrooms. Later in February, teachers noted that they and students loved the new curriculum. However, teachers also noted difficulties with the curriculum in terms of the reading level and basic math skills assumed of students. With test taking time around the corner, teachers noted the conflict they felt about implementing the curriculum as written or supplementing the curriculum, at least for this first year, with some basic skills drills. Their concern about the use of the materials increased when the Specialist provided them with test prep booklets.

Teachers at the intermediate grades expressed that students were having difficulty with the curriculum because it assumed prior knowledge and skills that they had not received under the previous math approach. Teachers noted that they used vocabulary and concepts familiar to students to attempt to bridge the knowledge gap, but this caused some difficulties with the OMS Facilitator who was working in the school.

Teachers at Chawla noted positive relations with the Specialist, many are former students of the Specialist, but they had mixed reviews on the help they received. The amount of time the Specialist spent with the teachers varied immensely, as one teacher noted that the Specialist almost weekly co-taught her class while others noted that they got a few minutes exchange of greetings in the hallway or by their classroom door but no substantive help from the Specialist.

The supports to implementation at Chawla appeared to be the principal's commitment to CMSI and the willingness of teachers to participate. Second Wave teachers were indistinguishable from the First Wave teachers as virtually all teachers in the building were involved in the Initiative and no one at the school used this terminology. Constraints appear to be the Specialist's lack of in-depth classroom coaching of the majority of teachers and the introduction of the curriculum at the intermediate grades where children did not have the background knowledge needed.

Success with phased-in school implementation.

Shirin Ebadi Elementary

The faculty at Shirin Ebadi Elementary has been offering standards-based science education for many years—the introduction of the CMSI simply allowed them to refresh and renew that vision. In a school of veteran teachers that is comfortable and professional, this CMSI IS science school had many supports.

The Specialist at Ebadi remarked positively that “There has never been more science taught in this school my entire [time here].” She saw these changes as lasting and deep. “I think it's the deepest most fundamental change that's possible in the school.” The teachers at the school have developed a common language and goal because the curriculum is being implemented across all grade levels. “A lot of times you get a program and it's for a grade level or two grade levels. Here they hit almost every level in the school, so we can do the spiral thing and talk, and I know what's happening in the third grade and kindergarten because it's built in.”

Teachers report that the support of OMS and the CMSI has been crucial in this process of adoption. “With the support that CMSI has provided, it has made it a part of our daily schedule.” Teachers at Ebadi had been previously trained in one of the science curricula, but, over the years, their use had tapered off. They point to the importance of continued district-level professional development and support to ensure the continued use of the science materials. “A lot of it depends on their follow-up...is this going to be like a one- or two-year shot deal?” Teachers at Ebadi expressed additional concern about issues of teacher turnover which could lead to the loss of trained and experienced curriculum users.

One major support to implementation at Ebadi is the high levels of expertise of the teachers, the Specialist and the principal. Teachers at Ebadi have been around long enough to see many CPS initiatives come and go and saw the CMSI favorably in comparison to other things they had seen.

In the 20-something years that I've been teaching, this is really the first time that I feel that there is something out there that is honest and true and really has tried to make a difference in the schools. I believe CMSI is really a legitimate program. I can't say that for other programs from CPS. Most of them I look at as a joke. This has a real foundation. It's exciting--the fact that we do have science Specialists in the schools--that it is teacher driven.

Two barriers were evidence in data analyzed from Ebadi. In the first place, the budget cuts at the end of 2003-04 really hit hard at Ebadi. After feeling so optimistic about the direction the District had taken, they were particularly deflated when they learned their funding for half their Specialist position and for the curricular materials would be cut.

In the second place, data suggested that although teachers were thankful for the opportunity for professional development, they were critical of the content and lack of choice. The veteran teachers appreciated the training they were receiving; they felt that the ongoing professional development and exchange of ideas was a crucial element to their commitment to using the science curricula on an ongoing basis. However, they were resentful of professional development that took them away from their students during the school day and were disappointed in not being able to choose the content and timing of their training. Throughout this tension with the type of professional development they received, the Specialist worked to address the situation in keeping with the distributive leadership philosophy of the school as she supported their individual needs and refrained from asserting authority over them. Still this vignette raises questions about the universality of professional development training for teachers. Should more experienced teachers be offered different types of training? Should teachers have more choice about the type of training and the timing of that training? How can a balance be struck between the views these teachers have of their needs and those of the professional development providers and OMS?

Victoria Ocampo Elementary

Victoria Ocampo is a large, diverse elementary school that was chosen as an Intensive Support science school. Highly committed to science education, the principal explained, "We made this our priority. We wrote it into the school improvement plan. We wrote in it that we were going to work on literacy and science together."

First Wave teachers at Ocampo thought that the introduction of the science curriculum had coordinated the school's approach to science in a way that they had not been able to do before. "This year has been more focused and consistent," one First Wave teacher stated. Teachers at the school also understood that the first year would be difficult. "This year is going to be hard, but I think that right now we're laying the groundwork." The Specialist thought that the First Wave teachers were enthusiastic about the materials. "The teachers who are using the materials this year, I have no doubt, they will continue doing [it]. The materials are phenomenal and the programs are great." At the end of the year, the Specialist recounted having seen 2nd grade bilingual students talking about science using scientific terminology in Spanish and English, 6th graders musing and making scientific connections, and 5th graders so involved in making a project work that they didn't want to go to lunch. "I have no doubt that we touched a lot of kids," she stated in a June 2004 interview.

The barriers to implementation at Ocampo were the school's large size and the number of other programs in which the school was involved. Scale-up in 2004-05 will involve an additional 50 teachers in the Initiative, a potential mentoring and materials nightmare for the Specialist. The Specialist explained, "I am deeply concerned about my Second Wave because I have no idea how we're going to be able to afford these materials...I don't know where we will get that money. I am really concerned about that, and I am concerned about myself and my ability to handle [more than sixty] teachers dealing with this program."

The Specialist maintained a regular visitation schedule with all of the First Wave teachers during the 2003-04 school year. Next year, to accommodate all of the Second Wave teachers, she will have to go from weekly classroom visits to monthly. She envisions the First Wave teachers being involved in helping with implementation but also knows that unless classroom responsibilities are lessened for them, they won't have time. There are also early indications that there will be a group of resistant teachers in the Second Wave as these teachers have expressed concern about the time involved in preparing and teaching the curricula as well as a their dislike for science.

The school's involvement in other programs with different foci is another potential barrier to the success of CMSI scale-up. The principal understood the goals of the literacy program and the science initiative as being complementary; however, the teachers were already overwhelmed with the reading program and felt overly burdened to carry both. In the words of the Specialist, "They know that reading comes first."

The story of Ocampo raises issues about school size. How can one Specialist work with and mentor sixty staff members in a meaningful way? Additional questions, which may or may not be linked with the size of the school, arise in regard to school goals and foci. How can the CMSI become a central focus in the school, especially in light of the dominance of the Chicago Reading Initiative in CPS?

Miriam Makeba Elementary

At Miriam Makeba, an Intensive Support math school, the curriculum implementation in 2003-04 among the First Wave teachers appeared to be positive. The Specialist believed that keeping up with pacing was the toughest part of the curricula. However, he saw most teachers keeping up the pace with the exception of two First Wave teachers who sometimes went in their own direction.

Two teachers that I've observed that I'm a little concerned about, [they are] going off on their own a little too much--Too much talking and wanting to be teacher directive. But I mean they're both top teachers, too. So, well, I know their past--you know, scores and things like that--and I don't really blame them in a way. But we're going to try, you know, because that interferes with the pacing, big time.

The principal at Makeba echoed that positive implementation was happening in this large school. She described seeing students actively participating in the new curricula and observing some Second Wave teachers talking about math and trying group work in math.

The enthusiasm of First Wave teachers and the plan to continue the Specialist position at full-time, despite budget cuts, are major positive aspects of the implementation at Makeba. The First Wave teachers made a concerted effort to implement the curricula, and the Specialist noted that he saw changes. "And I see the kids participating...and they seem to be really excited about it. And the teacher is not just standing up there and teaching." The loss of OMS funding for 50% of the Specialist position raised great concern on the part of the school as they imagined having to share their Specialist with another school. Thus the securing of funding for the other half of the position was a great gain for the school.

Barriers to implementation at Makeba include a lack of enthusiasm among the Second Wave teachers. At one in-service day, the Second Wave teachers had an optional meeting with the Specialist and only four attended. In addition, few supports existed in the schedule for ongoing collaboration among teachers. While researchers saw First Wave teachers engaged actively with the Specialist and each other during an in-service day, the school did not have common prep time or meeting times for these teachers of math.

The implementation story at Makeba reveals a story of slow progression toward the goal of full use of the selected curriculum. Evidence points to a high level of commitment of the First Wave teachers to implementation and commitment by the principal, who worked creatively to find funding for the lost half of the Specialist position. Questions remain about how this story will end, however. How resistant are resisters in the Second Wave? Can the Specialist combat this resistance, and how will the principal support the Initiative? Can full implementation occur with no common meeting structures to build consensus and support mechanisms for struggling teachers? The story of Makeba is still unfolding.

Challenges with full-school implementation.

Margaret Mead Elementary

In a small school with a high level of commitment to the principles of the science curricula, Margaret Mead was well-poised to open their doors as an OMS Intensive Support science school in 2003-04. At this small school, First Wave implementation meant virtually full implementation. At the same time, Mead committed to having two full-time persons devoted to science in the building; a science coordinator and the OMS-funded Specialist. The small size and high level of commitment to principles and supportive resources poised Mead for success as an Intensive Support school.

The new science curricula, though built on principles teachers at School 04 believed in, was very different than what most had previously used. This required school staff to make massive changes—a difficult and disconcerting process. The principal at Mead described the initial apprehension her teachers felt:

And I know the teachers were very apprehensive—since it's not textbook driven--on how the kids would do... You know, being teachers, we kind of like to have a textbook in front of us, you know, turn to page 353... So I think not having that is kind of scary. They feel like they're out there kind of bouncing, and they're not sure which way they're going to go.

Despite these apprehensions, data collected indicates that teachers at Mead have engaged in implementation. Teachers had both positive and negative comments on their perception about how implementation was proceeding. On the positive side, they talked about how nice it was to have all materials in a single kit (“It’s not like you have to pull from a bunch of different things. The directions are easy to follow... a list of what is needed for each experiment, as well as a list of what each kit contains.”). Teachers noted increases in cooperative learning and increases in interest in science.

Testimonials to the increases in the interest and excitement of the children came from the principal, the Specialist and the teachers at Mead. The principal stated, “Kids are excited, and they seem to be learning.” The Specialist at Mead was also very enthusiastic about the impact of CMSI. “It’s changing the dynamics of science education because the kids are moving away from... reading from the book to actual hands-on, inquiry-based learning, and that’s the best way to do it.”

At the same time, there were concerns and barriers to implementation. The principal at Mead thought that standardized test scores would be the most important indicator of progress. “Well... we have the formal assessments in the spring with ISAT and everything. And it will be interesting to see how our scores compare with how they were last year.” Data collection suggested that there were early indications that a decline in test scores might lead to changes in the usage of the curriculum, perhaps some supplementation.

Teachers had other concerns about materials management and organization and the plausibility of being able to make this work on a long-term basis in the hectic school day. Teachers in written reflections noted how the late arrival of materials ordered had thrown off scheduled experiments, leading to disorganization and chaotic results. Teachers were also very concerned about the lack of assessment in the materials and the amount of time and training it would take to develop meaningful assessments.

Perhaps most significantly, Mead, while a friendly staff, is one that was rather autonomous. Teachers rarely or never met together about any issues, much less gathered to talk about the CMSI. In a similar vein, an outside Specialist was hired primarily because no teachers in the building wanted the job. Knowing it was only committed for two years, this staff of autonomous and experienced teachers had little confidence in the sustainability of the position.

The high level of autonomy of the staff, the youngness and newness of the Specialist and the level of materials management required with the science curricula influenced the role of the Specialist. She worked with teachers individually, since there were few, if any, group meetings. Hesitant to ask too much of the teachers, the Specialist primarily provided assistance with materials on a classroom by classroom basis. Her limited experience as a teacher and with the science materials would make it difficult for her to provide meaningful mentoring to her colleagues. At the same time, the high need for materials organization and management in experiments took up most of her time spent in the classroom. She generally functioned as a classroom assistant rather than as a mentor. She expressed that at times she felt powerless and “did nothing all day.”

The small size of Mead, their commitment to the principles behind the science approach, the willingness of teachers to try the new curricula and the enthusiasm of the Specialist were the supports to successful implementation of the Initiative. The autonomy of the teaching staff, the focus on standardized test scores and the lack of deep work on the part of the Specialist were barriers to implementation of the initiative. As the school year ended, the Specialist position was discontinued with the decreases in funding by OMS. The outgoing Specialist had confidence that teachers who bought in to the curricula (about half of them) would be fine working with a Specialist shared with another school. The resistant teachers had not been moved to work with the curricula even when they had her as full time attending to their work. These were older veteran teachers. Neither the Specialist nor the Principal were able to provide the leadership this year to move them. However, next year, with new Specialist (although 50% at the school) and a new Principal (the former one is retiring) the situation will change. With highly skilled teachers and one Science Coordinator still in the building, the story of the CMSI in Mead is still unfolding.

Elizabeth Cady Stanton Elementary

Elizabeth Cady Stanton Elementary is an Intensive Support math school that showed positive signs at the beginning of 2003-04. The principal and Specialist were so enthusiastic about the math curriculum that the school immediately went to full implementation.

There was consensus among teachers in the focus group that the curriculum engaged the children in more complex thinking and that it integrated more reading into math. Primary teachers talked about the high levels of interest children had in math based on use of the new curriculum. In spite of this enthusiasm, there were the expected difficulties in implementing the new CMSI curriculum. Teachers reported that their pacing of the math curriculum had been off, primarily because the children who were not exposed to the curriculum in earlier grades were unfamiliar with the format and content.

Intermediate grade teachers in the school were having much more difficulty getting their children to adjust to the new approach and were worried about the students having to make another transition to the other math curriculum being used in the upper grades. Our researcher at the school reported earlier in the year that the teachers were attempting to use the new curriculum for the most part, although implementation has been very difficult and teachers are wondering aloud if there will be continued support for the curriculum if test scores did not go up.

Data collected at the end of the 2003-2004 suggested that things had begun to unravel at Stanton. The announcement of school test scores that had fallen dramatically in math led to tense relations between the Specialist and the principal, the Specialist and the teachers and among teachers. Teachers blamed teachers at other grade levels for not preparing their students with basic math skills. The principal expressed some doubts about the Specialist's work with the staff. Relations between the school and the OMS Facilitator also declined. Teachers reported that the OMS Facilitator assigned to their school, with whom they had had positive relations previously, soured when the Facilitator was "highly critical" and "not supportive of what they were trying to do." The principal opted to hire an outside curriculum support person rather than continue to rely on the Facilitator, and the staff blamed OMS for the state of affairs at the school, saying they were "impatient" with the staff for not being where they thought they should be. At the same time, the principal, having lost faith in the math curriculum after the decrease in test scores, began to allow teachers to supplement the CMSI curriculum with outside sources.

The year ended at Stanton on a sour note. Teachers, the Specialist and the principal were disenchanted with one another and with the curricula. Most of the teachers did not think the curricula would last in the school, although the Specialist was optimistic that the school's designation as Intensive Support from OMS would help to sustain it for a while longer. In June, although several teachers felt that there was still hope for the new curricula, the majority would "go back to the old curriculum in a heartbeat!" When asked about what would make their school successful in terms of math, a group of teachers exclaimed, "Let's use the old stuff! There was nothing wrong with it anyway!"

Challenges with phased-in school implementation.

Jane Goodall Elementary

In Jane Goodall Elementary, an Intensive Support math school, in the middle of the school year, the implementation appeared to vary. A few positive observations of teaching the curriculum were seen in primary grades, but middle grade teachers were not following the curriculum. Teachers across the grades were making negative comments about the implementation.

Likewise, the principal was not seen as participating in the implementation, and the Specialist regretted moving out of the classroom and into this new position. Achievement was a primary concern of the School 12 Principal, and the drop in test scores for 2003-04 did not help the principal or the teachers to increase their enthusiasm about using the curriculum. The Specialist, though she believed in the approach of the curriculum, would rather be "teaching the material...than going in the room and helping facilitate it."

By the end of the year, however, some shifts became evident that suggested a more positive development at Goodall. The Specialist felt more comfortable entering teachers' classrooms, and reported having a better understanding of how to do her job. She still felt that not all teachers were welcoming, but was much more comfortable in her role. The

principal admitted that he had not given much attention to the Initiative but that “Next year with so many more teachers coming on board, it should deserve my attention.” The Specialist had arranged for all Second Wave teachers to attend summer professional development, and the teachers were considering a “buddy” system so that First Wave and Second Wave teachers could work together. The Area Coach assisted the Specialist in organizing a Family Math Night, an event that was hugely successful and that the school hopes to continue into 2004-05. Perhaps most importantly, the principal recommended to the LSC that the Specialist position, which was cut to half time because of budget cuts, remain funded from the school budget. The LSC approved it, and the Specialist at Goodall will remain full time.

Helping to fuel the increasingly positive energies around the Initiative were parent and student attitudes toward it. The principal noted that students reported loving math and that parents loved the Family Math night:

Well, the scores went down this year. They went down 11 points last year in math, so they went down 4 points this year. So I'm hoping they'll go back up...But I noticed that we did a student survey, and every time when I passed [students] in the hallway, I asked them what they like best about [the] school and last year they would've answered computers, but this year they say math. [For parents] they wanted us just to have more [Family Math Night]. They had a major impact on parents and students.

Developing positive energy around the initiative at Goodall, then, seemed to be a result of the Specialist settling into her role and of student and parent enthusiasm for the program.

At the end of the 2003-04 school year, the story of Goodall was one of a positive change of direction. While Goodall has positive developments, it is difficult to know if they will sustain into next year and beyond. The principal is still very focused on test scores. He is also highly concerned about giving teacher training during the school day, noting that having substitutes so many days in a year “can affect the overall achievement of students.” The Specialist, despite the fact that her position is secure at least through 2004-05, doubted the sustainability of the program: “It’s just a two-year program, then it’s done.” Can the enthusiasm of parents and students for the math program keep the Initiative alive? Goodall is a story still developing.

Extent and Variability of Implementation at Intensive Support Schools

Based on our 9 case study Intensive Support schools (6 Math and 3 Science), the implementation of CMSI curricula and policies was pursued with vigor, found some successes, but also found some major challenges. Table D-3 summarizes our assessment of how the 9 schools fared in terms of various aspects of implementation. We describe the scale of implementation and the type of quality we observed.

**Table D-3: Descriptive Grid of 9 Intensive Support Case Study Schools
—Looking at Levels of Implementation**

	Schools “Facing challenges”			Schools “Finding successes”					
	Stanton	Mead	Goodall	Chawla	Lange	Child	Ebadi	Makeba	Ocampo
Implementation									
Full or Phased-in	full	full	phased-in	full	full	full	phased-in	phased-in	phased-in
Supplementing of Curricula	yes	yes	no	yes	yes	yes	yes	yes	yes
Resister(s) within First Wave Teacher Group	yes	yes	yes	no	no	yes	yes	yes	no
Critiques of Curricula	Students lack basic skills	Specific problems with lessons	Class size at school too large for group work	Students lack basic skills & language level	Like curricula	Like curricula	IES needs improvement	Students lack basic skills	Students lack language level
Time Scheduled for Teaching Math (min/day)	55	-	60	60	60 primary 50 middle grades	60	-	60	-
Time Scheduled for Teaching Science (min/week)	-	150	-	-	-	-	Struggling	-	Teacher determined

Ideally, we would like to talk about the implementation of CMSI curricula in terms of spread, depth, ownership, and sustainability. The spread of implementation can be considered both at the system and school level. It addresses the number of teachers who are implementing. Success in terms of spread is dependent on getting all teachers in all schools

on board. The depth of implementation addresses the teachers' understandings and abilities in using standards-based materials in a manner faithful to the intentions of the curricula authors. Teachers take ownership of the CMSI and the use of CMSI curricula when they understand and believe in these materials and the ideas and concepts behind them. These concepts become an integral aspect of teacher thinking and pedagogy when there is strong ownership. Sustainability of implementation refers to the development of an ongoing commitment to and enactment of this approach in math and science teaching, with or without an Initiative, with or without support from the OMS or any other outside assistance.

These concepts spread, depth, ownership and sustainability are multi-faceted and our study to date only touches on some proxy indicators for these. For example in terms of spread we know for case study schools about whether schools are full or phased in implementation and whether teachers are resisting when told to implement. For breadth, we know if teachers were faithfully using the curricula as authors intended or were supplementing the curricula with other materials. For ownership, we have commentary about the curricula made by teachers and others that shed insight into how much teachers have faith in the materials. Finally for sustainability we have an idea of how schools are allocating resources to move from 2003-2004 into implementation for 2004-2005.

In this section we look at spread, depth and ownership issues. We save issues around sustainability for a later section of this report.

In a sense "implementation" of CMSI curricula in these case schools can be described as the number of teachers per school using the curricula. For example in 5 of our 9 case study schools, many more than the First Wave teachers adopted the curricula.⁶ In terms of what this looked like on a school-level, these full implementation schools typically chose to use their full time Specialist and roughly \$10,000 from OMS to provide professional support and curricular materials for 20 or more teachers rather than only the 10 or so officially recognized First Wave teachers. This was a serious financial commitment on the part of the school and increased the heavy workload of the Specialist. This also meant that for our 9 case study schools, OMS funded 9 full-time Specialists and provided roughly \$90,000 for curricular materials. With the additional numbers of teachers participating per school, the numbers of implementing teachers went from around 90 to over 140 teachers—leveraging over 50% more teachers than if all schools chose the phased-in approach.

Yet implementation is more than just how many teachers had the purchased curricular materials and were supposed to be using it. There was a range of how teachers implemented that went for those who resisted using the materials to those who embraced the new way of teaching. Measuring these various qualities of implementation was difficult (and will be an area of more focused attention in 2004-05). However, we do offer a sense of how these qualities of implementation played out in our case study schools.

In 3 of the 4 phased-in implementation schools, there was still some resistance with one or two First Wave teachers who tried to avoid having the Specialist visit their classrooms or, as one of the Specialists said, were just "not doing it." In 4 of the 5 schools attempting full implementation, at least one teacher was not using the new curricula regularly.

Through a comparative analysis of the 6 Intensive Support Math schools we find evidence that at least 5 of the 6 schools were implementing the CMSI curricula in a manner where they supplemented by using outside curricular materials. The CMSI mandate was for Intensive Support schools to "trust the curriculum" and use it faithfully without supplementing. Yet across these schools we saw the following:

- A CMSI funded school-based Specialist handing out supplemental test prep books to teachers
- A principal changing her policy mid-year and announcing that teachers can supplement the curriculum with more "traditional" math
- A Specialist allowing some teachers to use their own non-CMSI materials if they still make sure the required standards are covered and the students "don't miss anything"
- A handful of resistant teachers thinking about using the old texts from previous years as their principal planned to dispose of the old texts during the summer break so to avoid this supplementing next year
- A couple teachers who while trying to use the CMSI materials would sometimes "go off on their own a little too much" and overdo the lecturing

⁶ At this point in time, we do not know how this compares to district wide implementation. Further examination of this will be pursued.

- Teachers supplementing a curriculum as they prepare students for high stakes tests and justifying this by stating that this was approved by one of the CMSI professional development provider groups who said that given that the students are new to the curriculum sequence, teachers need to fill some gaps with supplemental materials

Another indicator of how teachers implement the curricula was how well they were able to keep up with the suggested pace of covering the lessons. While we do not have systematic data on the pace maintained at the case schools, we do have cross case data on the concern that Specialists, principals and teachers expressed about pacing. This was a major topic of concern when they spoke about using these new curricula. At 6 of the 9 schools there was an expression of concern for how difficult teachers found it to keep up with the suggested pace of teaching.

Finally, how teachers critiqued the curricula added some insight related to how they might be using the curricula. At 3 of the schools, teachers expressed significant concern that their students did not have mastery of the basic skills that the curricula assumed for a given level. Since students had been using other curricula in the past, teachers assumed that once the whole school was using the CMSI curricula coherently, students would be progressing from grade to grade with the appropriate backgrounds. At one of the schools having difficulty with implementation, the concern for student background in relation to the curricula was especially pronounced. One teacher stated, "If you teach [this curriculum] from preschool to whatever grade it goes to, then that's fine, but you can't expect to bring in something like that where you need prior knowledge and expect our kids to succeed." Another teacher exclaimed, "[This curriculum] is set up for kids who have prior knowledge. You have to keep reaching back and giving them the foundation, but we can't use our old curriculum!" There was a consensus that they were all falling behind where they should be according to the pacing schedule. One teacher stated

These goals that CMSI wants us to reach are unrealistic. If a child doesn't know 8+7, how is that child gonna graph? This is for kids who come from two-parent homes who have someone working with them at home spending quality time with them. You can't expect for us to reach the same thing. You can't throw this on a child and say, 'learn it!' I'm not saying our kids aren't smart, I'm just saying they have to be trained from day one.

Although this group of teachers seemed displeased with the curriculum, they felt that the curriculum could work after several years. That is, all students, including kindergarten, would have the foundation and prior knowledge in order to be successful.

Evidence suggests that there were some aspects of the science curriculum materials that were especially challenging to teachers. First Wave teachers in the Intensive Support science schools reported some challenges with the science curriculum in terms of assessment, animal rights issues, and the 6th grade curriculum. Some teachers reported that the assessments were so difficult that they must be modified or many of the students would fail. "If I am doing this next year," one teacher stated, "I'm going to spend a good deal of time going over every reading assignment and reworking it." At another school, a teacher reported having difficulty with the program's treatment of live organisms. "I'm such an animal person. I really have a hard time with it. I don't think I would do it again. I will do the other parts of the program, but I think that part of it needs to be teaching kids to be respectful of the animals." The comments above were limited to one or a few teachers. Comments about problems with the sixth grade science curriculum were more common and shared by many teachers using this level of the science program. "Our sixth grade is really floundering...they are having trouble with the student text as well as the teachers manuals...You have to refer to this, you have to put that in the report, you have to." At another Intensive Support science school, a Specialist made a similar statement about the sixth grade program. "The material is very high-level reading, and these kids haven't come in with the science background that the program assumes they know how to do, and it assumes that they have certain scientific knowledge that they don't have, certain vocabulary they don't have." Similarly, a teacher at the same school stated, "It doesn't match well with what comes before or what comes after. It doesn't fit." At the third sample science school, teachers made similar comments. She suggested that the weather and climate unit in sixth grade was too detailed and that some experiments didn't work correctly. "They need to be tested more," she stated.

These concerns are not exclusive to science curricula alone. A number of teachers using the math curricula also noted concerns. The lack of Spanish materials or poorly translated Spanish materials was common. In addition, teachers in four schools noted that the reading level in the math curricula was much too high for their students so that even if their students were English readers, they still needed to translate the English to the level their students could understand. A teacher at another school noted that the curricula did not work well for her because her class size was over 30.

Even in schools where teachers were implementing with some success, right below the surface teachers continued to need reassurance that the spiraling nature of the curricula would allow their students to learn what they needed in order to succeed on standardized tests. Their fragile sense of trust in this aspect of the curricula will likely need to be monitored and strengthened if implementation is to succeed.

Aside from implementing the CMSI curricula, the other critical policy related to classroom engagement of students is that of having 60 minutes of math a day and 150 minutes of science a week. While we do not find flagrant violation of this policy, we did have two math schools where the 60 minutes was not scheduled as a consecutive period but instead 50 minutes in one case and 55 in other – the remaining required math time expected to be picked up at other times of the day.

Factors Supporting Implementation at Intensive Support Schools

The strategy that the designers of the CMSI espoused for school improvement involves working to develop the skills and experiences of the instructional workforce and providing the infrastructure so those professionals can implement high quality instruction using CMSI curricula in classrooms. Understandably, our findings can be framed in terms of supports for the development of the workforce and also infrastructure issues supporting these human resources.

Early lessons indicate that a number of factors related to general school background, work force development, and infrastructure support implementation. In particular, our cross case analysis indicates CMSI implementation is supported by the following factors: the school's past experience using a curriculum, strong professional development within and outside of the classroom, principal support, teacher leadership, levels of trust within the school community, and the fit between the CMSI and the school context. Table D-4 illustrates some of the patterns in our case study Intensive Support schools.

**Table D-4: Descriptive Grid of 9 Intensive Support Case Study Schools
—Looking for Patterns of Factors Influencing Implementation**

	Schools “Facing challenges”			Schools “Finding successes”					
	Stanton	Mead	Goodall	Chawla	Lange	Child	Ebadi	Makeba	Ocampo
Implementation									
Full or Phased-in	full	full	phased-in	full	full	full	phased-in	phased-in	phased-in
General Characteristics									
# Teachers of Math Total	> 20	> 10	> 20	> 30	> 20	> 25	> 20	> 30	> 50
Student Achievement Level at School for Gr 3-8 At/Above Norm on ITBS Math in 2003	>50%	>60%	>70%	>40%	>70%	>50%	>70%	>40%	>60%
Prior Experience with Curricula	no	no	no	no	yes	no	yes	no	yes
Percent of Classes Taught by Not Qualified Teacher	0 to 5%	greater than 10%	0 to 5%	greater than 10%	0 to 5%	greater than 10%	0 to 5%	greater than 10%	between 5 to 10%
Curricula	MTB CM	SC	EM MTH	MTB CM	MTB MTH	MTB MTH	SC	EM CM	SC
OMS Application Rating	0 to 15	15 to 20	15 to 20	0 to 15	15 to 20	15 to 20	0 to 15	15 to 20	15 to 20
Workforce Development									
# Teachers Attended Summer 2003 Prof Dev	20 to 25	10 to 15	5 to 10	10 to 15	5 to 10	10 to 15	10 to 15	10 to 15	5 to 10
Teacher Views on Quality of Curricula Prof Dev 2003-04	discouraging because teachers do not feel it is realistic to use in their classrooms	some logistics problems and later they stopped going	positive	positive	some experienced teachers did not find it met their needs	some logistics problems but positive	positive but some critiques on specific lessons	positive	positive
Specialist Co-teaches Including Pre- & Post-Mtgs	some	no	some	to small extent	yes	yes	some	yes	yes
Has Grade Level Prep That Were Used to Discuss Math	yes	no	yes	informal chats at lunch	yes	yes	unclear	no	unclear
School Infrastructure and Culture									
Specialist Characteristics	At school 10 or more years	New to school	At school 10 or more years	At school 10 or more years	At school 10 or more years	New to school	At school 10 or more years	At school 10 or more years	At school 10 or more years
Principal Characteristics	new to school	retiring soon	at school 10 or more years	at school 10 or more years	at school 10 or more years	new to school	at school 10 or more years	at school 10 or more years	at school 10 or more years
Principal Level of Support for and Knowledge of CMSI	low	low	medium	high	high	high	high	medium	high
School Relationship with OMS Facilitator	problematic	ok early, later problem	ok	mixed, want opportunity for feedback	ok	ok	ok	ok	ok
Trust Among Staff	problematic	problematic	varies	ok, wish for opportunity for feedback	ok	ok, but problematic at one grade	varies	ok	good
Teacher Leaders Involved	no	no	unclear	unclear	on time	yes	yes	yes	yes
Delivery of Curricular Materials to School	some late	some late	some late - Sept	some late -Jan	unclear	some late- Oct	unclear	on time	some late
Students and Parents Like the Curricula	unclear	yes	yes, very much	yes	yes	yes	yes	yes	yes
Issues of Fit with the School	negative – started a new math curricula in '02-03 that they liked	mixed – not central to principal but history of science coordinator	mixed-math not central but some inquiry based teaching	positive—prin/teach sold on S-B and want to participate in CMSI	positive - history of focus on math and science	positive – fit timing for getting new texts and interest of principal	positive – history with one of science curricula	mixed – reading top priority but history of math coordinator	positive – history of science interest and principal interest

Based on the cross case analysis summarized by Table D-4, we proceed by describing the factors that seem to be important to the stories of school implementation. We discuss all of these factors in the order they are listed in the table. However, we also note that some of these factors appear to correspond to a pattern. In some cases, the presence of a certain positive condition is more common in schools which are finding relatively more implementation success than others. In other cases there are challenges that seem to be more prevalent in the schools that are struggling than they are in the more successful schools.

Based on systematic cross case analysis, the factors in Table D-4 appear to be important parts of the stories of school implementation; however, some seem to be more strongly related to whether or not a case study school experienced success or more challenge in terms of its implementation of CMSI curricula. Our discussion follows the outline below.

- General school background
 - Full or partial implementation
 - Size of teaching force
 - Student achievement level
 - Past experience using the curricula
 - Teacher qualification level
 - Specific curricula using
 - Initial OMS CMSI application rating
- Work force development
 - Professional development outside of the classroom
 - Professional development within classroom
 - Grade level preps
- School Infrastructure and Culture
 - Principal and Specialist time at school
 - Principal support
 - School relationship with OMS Facilitator
 - Trust within the school community
 - Teacher leadership
 - Delivery of curricular materials at school
 - Reaction of students and parents to curricula
 - Commitment and fit between the CMSI and the school context

General school background

Included in this section are a number of general school characteristics. These characteristics include level of implementation, the size of the teaching force, the level of student achievement based on the 2003 ITBS, teachers past experience using the curricula, the curricula being implemented, and the initial OMS CMSI application rating for the school. Of all of these characteristics, teachers past experience using the curricula is the only factor that seems to have a pattern. The pattern we note is that schools facing challenges implementing the curricula tend to have teachers with little or no experience using it. However, three of our schools finding success also had teachers without experience in the curricula.

a) Full or partial implementation. Whether a school participated in full or partial implementation of the new curricula seems to indicate little about its ability to find success. Three of our four schools adhering to the phased-in approach show a pattern of finding success. At the same time, 3 of our 5 sample schools that went full scale the first year also found success. We believe either full or partial implementation can lead to success and recognize that factors we discuss below may be more essential to this end.

b) Size of teaching force. Our schools facing challenges and finding success shared similar school size; however, a few of our finding successes schools were even larger than our more challenged schools. All in all, the size of the teaching force was not indicative of a school's ability to find success.

Still, some schools saw their size as a barrier. At some Intensive Support science and math schools, the administration and a group of passionate First Wave teachers volunteered to spearhead the Initiative, and strongly supported it. However, moving forward, some see the addition of more teachers during the next phase of implementation as being

wrought with challenges. The Specialists in these large schools will have to support a huge number of teachers, some of whom are reported to be possible sources of resistance.

In addition to the size of the teaching force, schools of every size need to address teacher turnover. Within the first year of CMSI implementation, teacher turnover challenged some schools. A few of the First Wave teachers who went through summer training, left their school or changed grades. While the training may have been useful for their development, it provided little support to their schools as these schools then scrambled to have trained First Wave teachers in every grade. For example, one school that faced teacher turnover struggled to implement the new curriculum using a series of substitute teachers. In other case study schools, First Wave teachers left the classroom mid-year or at the end of the year. Although the departure of teachers who have been trained in the CMSI curricula is certainly a loss for the local school, we don't see this as a total loss, if, in fact, these teachers remain within the system. Still, this is an area of concern for the future of the Initiative.

c) Student achievement level. Student achievement level from 2003 shows no pattern to indicate whether a school will face challenges or find success. Schools with past student achievement at relatively high or relatively lower levels are finding initial successes in implementation.

d) Past experience using curricula. Half (3 of 6) of the schools finding more success with the implementation had teachers who previously used one of the curricula their school as a whole was trying to implement as part of the CMSI effort. According to our data, schools facing challenges had no teachers experienced in the curricula they were implementing.

e) Teacher qualification level. When looking at the percent of teachers in a school that are designated as not "highly qualified" according to NCLB standards, we again find no pattern to how this factor influences a school's level of successful implementation.

f) Specific curricula using. We recognize that although the curricula are all standards-based, there are inherent differences in them from the content covered to the materials included to the assumptions made about students' ability levels. Many schools complained of curricula not meeting the needs of bilingual/second language learners either because the curricula did not exist in the students' language and/or the curricula did exist, but wasn't delivered to the school in time for students to use it the first year. Others complained that curricula were written at reading levels beyond the reading levels of students. Still others complained that students didn't have the basic skills assumed by the curricula. However we find no patterns in schools having more successes with any curriculum compared to any other curriculum.

g) Initial OMS CMSI application rating. According to the cross case analysis, we find no pattern in a school's success in implementing the curricula based on the OMS rating of the school's application. The ratings were based on OMS staff assessment of the schools' commitment to the CMSI and teachers' and principals' leadership ability to collaborate within the school.

Workforce development

In looking at workforce development, we focus on two types of professional development: development outside of the classroom and development within the classroom. Professional development outside the classroom includes the training teachers received from providers in summer 2003 and throughout the school year. Professional development within the classroom includes both Specialist and Facilitator coaching of teachers including pre- and post-conferencing. In addition, we consider whether a school has grade level preparation time as a factor in workforce development. The first two of these workforce development factors seem to be related to schools finding success while the later lacks any clear pattern of influence according to the data we currently have.

a) Professional development outside of the classroom. According to our data in Table D4, the number of teachers who attended summer 2003 professional development curriculum workshops seems to be irrelevant to a school's successful implementation. On the other hand, teachers' attitudes towards school year professional development seems more salient to a school's level of success. In some of our case study schools, teachers attended professional development workshops taught by their Specialist and/or OMS staff. This usually happened in the case of teachers who missed the summer 2003 professional development and/or in the case of Second Wave teachers who chose to begin teaching as materials became available in their school. This, again, speaks to "attitudes" over "attendance."

Teachers at the more successful implementing case schools spoke about the positive experiences they had in these various types of development opportunities. Teachers describing their experiences in summer and school year curriculum workshops noted benefits that included learning from teachers at other schools including being reassured that others also found these curricula challenging to teach the first time. One explained,

Yesterday we had that meeting, and I had forgotten how much I rely on the others. We reflect on our own experience and get a chance to talk to the others. Yesterday I spent the day with only 7th grade teachers. Finding out that I was in the midrange encouraged me that I was going not too fast but not too slow; what mistakes I may have made that I would want to correct the next time, we can reflect on those. The meetings, the trainings and being able to meet with the others have been major.

A teacher from another school described the benefits of CMSI meetings as follows:

Those monthly meetings with other teachers—at first I thought ‘oh, no’—but you go over, and it’s interesting to hear new ideas--what other people are doing with the same program at the same time that you’re doing it.

OMS Facilitators commented on the effects of the academic year curriculum training on teacher preparedness for implementation. One Math Facilitator suggested that she could tell the difference in implementation between those who were attending OMS curriculum training and those who weren’t almost immediately when she entered a classroom.

It is like night and day--the classrooms of teachers who attend regular professional development and those who aren’t going--I think you see it most in two things: the number of strategies the teacher has to present a lesson and in the organization of the materials...First of all, this training touches deep instructional issues; it changes the type and level of questions the teacher asks and the number of strategies they have in very noticeable ways. At the same time, the training also lets teachers share the kind of Tupperware they keep their base ten blocks in and “you get it at Ikea,” you know, stuff that helps organization. I can see that in the materials organization in the classroom.

Another Math Facilitator noted that the teachers know who in their school is attending OMS sponsored professional development, too.

The teachers know who is going, too. They are always saying things like ‘she doesn’t do such and such in her classroom since she doesn’t go to the training.’

While there were criticisms of the OMS professional development that teachers were receiving such as the timing, organization, or material covered, there was nearly universal appreciation in the successfully implementing case study schools for ongoing, intensive professional development. The criticisms of and reactions to the professional development workshops by the two schools having the most challenging time implementing were quite different than the comments from the other schools. At one of the challenged schools, the teachers eventually stopped attending the school year professional development. Teachers cited some problems with logistical issues like last minute changes in location but also clearly noted their many criticisms of the curricula as well. At another challenged implementing school, the teachers expressed their concern that attending the workshops was discouraging because they felt the curricula, as demonstrated at the workshops, were unrealistic for their students. While other schools also had worried about their students not having needed basic skills for the curricula, their sense of discouragement was not as great as at this challenged school.

In focus groups at two full implementation schools, teachers that attended the summer workshops stated that they had learned much from that experience; those teachers that did not attend the summer sessions explained how OMS staff and their Specialist provided workshop experiences for them at their school. Irregardless of their participation in the summer workshops, all of the teachers in these focus groups attended school year curricula classes and saw them as useful. A teacher at a phased-in implementation school also explained how she appreciated the help she had at her school.

It’s also a unifying experience because we meet all the time. I feel supported not only by CMSI but here, right at the school level, and I can go to other people and talk about it and [our Specialist] is right here to support and help. So, it’s really nice.

b) Professional development within the classroom. In most of the schools with more success in implementation, the Specialist was working one-on-one with First Wave teachers and co-teaching with them in their classrooms. This was not an easy task to do but was one of the core role components of the Specialists. The Specialists at one of the phased-in implementation schools finding some success explained that it was challenging to get into teachers' classrooms because although all but one of her First Wave teachers welcomed her visits, they all taught math between 11 am and 2 pm, which made it hard for her to see all of them each week. She also explained her strategy to make the co-teaching pre- and post-meetings productive. She tried to focus on what and how the students were learning and stayed away from saying anything that the teacher might think was an evaluation of her teaching.

Although many of the Specialists went into teachers' classrooms to offer coaching on implementation, the level of this coaching varied according to Specialists and according to the perceived needs of the teacher and the relationship between teacher and Specialist. So it is not surprising that in another school finding success teachers held mixed views of the effectiveness of the Specialists work with them. In one school, a number of teachers complained that the Specialist, whom they all had a positive relationship with, was not pre- and post-conferencing with them nor was she spending any quality time co-teaching. These teachers hungered for this type of professional interaction. Yet, one teacher in this focus group was shocked by these comments noting that the Specialist was always in her room helping teach the lesson. As it turns out, this may be a case of the Specialist trying to compensate for a weak teacher at the expense of the rest.⁷

School reports indicated the Specialists were playing a crucial role in the implementation of CMSI in Intensive Support schools through their efforts to provide training within classrooms through their co-teaching and in other ways. For example, a teacher at an Intensive Support science school stated, "The most important thing is having an on-site Specialist. That is the best thing about this program. I don't think I'd be doing it as well, as efficiently or as consistently if [the Specialist] wasn't here". The role Specialists were playing, in the coordination of materials has been described as crucial and life-saving in case study schools. One principal spoke about how the implementation of the curriculum, especially on the part of those with the lowest content knowledge and those most resistant, was only successful due to the work of the Specialist. Further evidence of the centrality of the Specialist position comes from the fact that a portion of Intensive Support schools who lost ½ of their funding for the role have opted to pay for the other half out of school funds to keep the position at full-time. We do not have the numbers for the CMSI schools as a whole, but in our case study sample all but one of the schools that lost funding supplemented from their own budget to keep the role.

c) Grade level preparation time. The Specialists were challenged to schedule time to meet with teachers as a group and to get into classrooms to observe teaching. Several noted that it was difficult to see the First Wave teachers every week given that math was often taught at the same time during the day across grades. Others noted that they had to share time during common grade level prep period meetings with other professionals like reading specialists who also wanted to work with teachers during that time. Still others noted that there were not common prep periods to meet with First Wave teachers. Some tried before or after school meetings but attendance was irregular.

School Infrastructure and Culture

The right types of relationships and resources are needed to support successful implementation. Several school infrastructure and culture issues were particularly important and seemingly influential on the level of success of our case study schools: principal support, teacher leadership, trust within the school community and the "fit" between the Initiative and the school. While other factors like the principal's and Specialist's time at the school, the level of support provided by the OMS Facilitator, the timely delivery of classroom materials, and parents' and students' reaction to the curricula seem to lack any definite pattern of support.

a) Specialist and principal time at school. The number of years Specialists and principals spent at the school is similar across our cases of schools facing challenges and schools finding success. Looking beyond this, we note the interests and skills of the Specialists (and principals) are also critical in how the school functions in supporting or failing to support the CMSI. Some of the case schools face some challenges given their Specialists. For example, in one Intensive Support school that is also a math science cluster school, the Specialist was selected in a way that may not make the best use of interests and skills. The principal and LSC needed to name a CMSI Specialist but neither cluster specialist wanted the position. Nonetheless, one of the Specialists became the CMSI Specialist and the principal explained that this Specialist was being closely monitored because of his lack of appropriate skills for this position. In another Intensive Support school, the Specialist told researchers that she was now regretting leaving classroom teaching because the new job

⁷ In an interview with the principal in June 2004, we learned that a number a few teachers would not be returning in 2004-05 as they did were not considered Highly Qualified for the No Child Left Behind Act.

working with other teachers is not as enjoyable as hoped. Even in a school where researchers saw the Specialist doing good coaching with teachers, the Specialist noted that that coaching work was very new to him and that he need to improve these skills.

Just as Specialists bring varied skill sets to their support of CMSI, so do principals. Below we note, some principals are well informed and enthusiastic about CMSI while others are skeptical and/or misinformed. And, like Specialists, even some principals who are active and well informed still feel the need to learn more in order to better support the Initiative. One principal explained early in the school year that she felt the need to learn much more about how to walk into the classrooms and tell if the teachers were properly implementing the curriculum. (This principal and others later attended OMS meetings where curricula experts attempted to answer some of their questions.)

b) Principal Support. Principals showed evidence of active support of CMSI goals in the 6 case schools where implementation was finding the most success. They did this by meeting with their Specialists on a regular basis, involving their Specialist in school-wide planning meetings, and giving a clear message to their teachers that implementing the CMSI curricula was important. The principals varied in how they provided these supports. For example at one school, the principal observed math classrooms throughout the school year, met with the Specialist weekly, added the Specialist to the school's leadership team, and raised the issue of implementing the new curricula during the teachers' evaluations. Regarding the evaluations she explained:

Well, in their evaluation, I did point out if they were implementing [the curriculum] and I put that as a strength. If they didn't [implement], I put it as a weakness right on there [on the evaluation]--that professional criteria--professional development [in the CMSI curricula]. They are all expected to go. And they all know now that that is going to be part of their observation, and it will be written in there.

At another school the principal talked with one teacher who did not want to implement the new curriculum because she had not attended the earlier professional development. However the principal's expectation was that all the teachers were involved and the school was fully implementing with all classrooms. As she said, "This is not optional." She reminded the Specialist that the teacher needed to get started just as other teachers had. Therefore, the Specialist made arrangements for the teacher to receive individual help by bringing in someone from the professional development group working with the curriculum and had the teacher attend some additional professional development. This teacher began to implement the program well.

Yet at two other schools, the principals were very clear that they felt teacher buy in to the implementation had to be more nuanced. As one of them said, it could not be "pushed down their throats." Another described it as a process of collaboration between administration and the teachers, not to be considered an aspect of the evaluation process. Yet these two principals actively supported their Specialists, attended OMS meetings for principals, and worked to find the resources needed for the Initiative.

c) Relationships with OMS Facilitators. The extent to which the OMS Facilitator was a crucial support for implementation, then, varied across our sample schools. In most schools, teachers and the principal suggested that the Facilitator was a positive force in the school and wished for higher involvement. However in a couple schools, staff had negative comments about the work of the Facilitator.

Principals, Teachers and Specialists in Intensive Science schools report high involvement of OMS Science Facilitators in their school. Teachers in a focus group stated

We see the Facilitator all the time...You don't get the feeling that she's coming and watching you. She's really trying to figure out, 'Is it working?' You know are the kids really getting what they're supposed to be getting from this?

At another of the sample Intensive Science schools the Specialist stated

My Facilitator has been out to see me weekly...She's coming tomorrow to observe in the sixth-grade classrooms since sixth grade is such an issue.

The principals, teachers and Specialists of the Intensive Support Math schools in the sample generally suggested they had positive but more distant relations with their OMS Facilitators. For example, in one school the Specialist explained that the OMS Facilitator met with teachers and did observations of teachers and then passed along comments about teachers

to the Specialist who then provided feedback to the teachers. Teachers in this school were thankful for the Facilitator and wished for more involvement. “We want her here so we can know what we are doing---or not doing---so we’re not making constant mistakes!” Another teacher at this school stated she wished that the Facilitator was just more visible in the school. This was a typical response of teachers in our Intensive Support math schools.

In another Intensive Support math school, teachers had mixed feelings about the work of the Facilitator. On one hand, they appreciated the Facilitator’s and Specialist’s “extra pair of hands” in their classroom, but resented this help when it led to confusion of students when, on some occasions, one or both of these helpers contradicted the teacher or used terminology the students didn’t understand. Still others longed for the Specialist and Facilitator to challenge their professional growth.

Teacher 1: They should meet with us before hand and say, “Tell us what the make up of the class is that I’m about to see, tell us what is going on, what exactly have you been able to do, where are you?” She (the OMS Facilitator) came in my classroom once, and I had even filled out a form about exactly where we are and everything. She came in and said, “Where are you?” I’m like what do you mean? I typed out this thing and she’s going to say, “Where are you?” I was like “Why do I waste my time!” And I gave a copy to [the Specialist] and a copy for her...They need to pre-conference with me and they shouldn’t just come in and not tell me anything, they should post-conference with me as well!

Teacher 2: Well, my post conference was at the door on the way out!

Teacher 1: I don’t think that’s effective either. I think, put [the Specialist] in the room while you spend twenty minutes with me and talk to me about what’s going on so that there is some communication. Cause talking to me for five minutes while we are getting ready to leave is not helping me to be a better teacher!

d) Trust within the school community. Trusting and interactive relationships within the school community seemed to support CMSI implementation. At one school with strong trusting relationships, work was very collaborative. The principal and teachers described how decisions about curriculum and programming were made as a team. At the same school, the Specialist described her work in classrooms as being one devoted to teacher service in a timely and useful way. The principal at this school, similar to principals at other high-trust schools, tended to be complimentary of her staff as well. This principal described the First Wave teachers with a great deal of respect.

I call them “The Magnificent Ten,” I felt like I had a gifted group of staff members. These are innovators and go-get-em teachers that...were energized, but we’re looking for direction in terms of innovation. They’re risk takers.

Weaker interactions and lack of trust hindered CMSI implementation at some schools. In the process of implementing the CMSI curricula tensions arose between the Specialist and the teachers, between the principal and teachers, and between the principal and the Specialist. These tensions threatened the collaborations needed to successfully participate in the CMSI. For example, in one school, miscommunication about the delivery of curriculum materials sparked mistrust between a teacher and the Specialist. While outside mediation helped resolve some of the problems between these two staff, the teachers in this school were highly skeptical about the materials. This continued to put a strain on the relationships between the Specialist and teachers. At another school facing challenges to implementation, relationships were characterized by a great deal of distance and a high degree of teacher autonomy. First Wave teachers did not meet together, and the Specialist’s work with the teachers was done purely one-on-one. Still there was an element of trust from the perspective of the Specialist at this school who stated, “She [the principal] knows all of her classrooms are in good care, and that’s what I think helps build such a great foundation knowing that other teachers are respected.” On the other hand, the Specialist did not feel the teachers respected her and trusted her to offer them a much help.

e) Teacher leadership. In four of the six more successful schools, we found evidence that teacher leaders had emerged who championed CMSI in their school in strategic ways. In one case, a primary grade teacher held weekly meetings after school in his room for teachers implementing at that grade level. In another school First Wave teachers met regularly to support each other and to plan how to help Second Wave teachers as they begin to implement the curricula.

f) Delivery of curricular materials at school. In 6 of our 9 schools we have definite information about schools getting materials late and know of only 2 schools in our sample who say that they received their materials on time. The materials not received on time range from certain grade levels or types of materials to the entire grade range for bilingual materials.

Obviously, without these materials teachers were not able to implement all aspects of the curricula at the same time. In the case of bilingual teachers, many opted out of implementing until the materials arrived at their school as it became too difficult to continue to translate student materials on a daily basis.

g) Reaction of students and parents to curricula. In almost all of our case study schools, staff noted positive reactions to the curriculum by students and felt encouraged to persist in implementing accordingly. For example, at one science Intensive Support school, a principal noted that students enjoyed the cooperative learning involved in the new CMSI curriculum. “The students’ interest level is high due to all of the hands-on activities, and cooperative learning skills are improving because students are working in small groups more often.” The weight of students’ positive reaction becomes more clear when the principal later juxtaposed it to a challenge of the new curriculum. “It’s exciting for students in that they seem to be learning what’s presented in it [which] outweighs the disadvantage of the time that it takes to set up.” In another school teachers commented on how well students were working together and how students from all abilities were able to learn from this curriculum. At another school a teacher reported that

The kids don’t get upset when you tell them that we’re doing science--that’s what I notice--because before it was textbook, and it was boring, but now they want to know, “When are we doing science?” They want to do it

This sentiment was noted in both math and science Intensive Support schools by various actors— through interviews with principals, Specialists, teachers, and OMS Facilitators and through observations researchers made of students and parents.

h) Commitment and fit between the CMSI and the school context. Here we note that commitment to the implementation was wide spread in the case study schools. Many schools showed this in terms of their voluntary full implementation. All of the schools allocated a great deal of their discretionary funds to support CMSI. Schools also showed that the CMSI was a high priority for them through their willingness and commitment to creatively solve problem around issues that implementation raised. School schedules were arranged and rearranged to make time for 60 minutes of math, for meetings at grade level, for extended science lab time.

However, in several Intensive Support case study schools, links between school commitment and the CMSI are either unclear or weak. Concerns that a focus on the new curriculum may not lead to needed increases in test scores were common. For example, one principal stated, “The only fear I still have is the kids are not used to this. How are they going to test? How will they do? Because it’s different from what I have seen in the past, you know, so I’m wondering. Are they going to test well?” At Intensive Support schools, goals focused on standardized tests often were primary, and the schools continued support of the CMSI depended on immediate increases in this area.

In addition, some principals expressed conditional financial support for the CMSI based on continued teacher commitment to and support of the programs. In several of the schools, the principals were very concerned about being able to commit the necessary resources to support the Second Wave implementation. Specialists saw the teachers react to this uncertainty about future funding when they did things like refuse to let their students write in work books— believing that they would not have funds to replace these books each year. At another school the teachers, who were used to having students refrain from writing in “consumable” books, would not allow writing in the work books until the OMS Facilitator talked with the principal.

Fit between the CMSI and the school sets an important context for the implementation of new math or science curricula. How closely does the CMSI match the normative priorities of a school and how good is the timing for the school to adopt these new curricula? Schools with a positive fit are more likely to find significant success as implementers, and schools with some problems in the area of fit are more likely to have less successful implementations. Schools with some past experience focusing on math and science education were a better fit with the Initiative. Schools that had not recently purchased a new math or science curricula were a stronger fit. Those with the stronger fit were more likely to find more successful implementation. And still, even in schools that were finding some successful implementation there were tensions in terms of the fit of the Initiative with the school. For example, about half of the case study Intensive Support schools were also new participants in the CPS Reading Initiative—which also required teachers to spend a great deal of time in professional development workshops. A stark example of this occurred at a school’s restructured day where teachers had to choose to attend one of four concurrent professional development sessions. About a quarter of the teachers attended the session on the Reading Initiative. Only 4 teachers (less than 10%) showed up at the CMSI session .

Readiness Schools

We now reflect upon how Readiness case study schools worked to prepare to adopt CMSI curricula. Did Readiness schools become better prepared to select a new curriculum? Did they become more coherent and committed to improving math/science? After we provide 3 descriptive vignettes of Readiness schools, we offer some thoughts on the challenges they faced and the successes they experienced.⁸

Descriptive Vignettes of Readiness Schools

Christine de Pizan Elementary

Christine de Pizan Elementary, a Readiness Math school, first began to take its steps at implementation during 2003-04. A few of the designated First Wave teachers occasionally tried out things they learned at TAMS professional development. Most of the teachers in this school stated that they had tried at least one activity as of October, 2003 and some had tried several. The general reaction was that the activities required a lot of preparation time but that the pay-offs were also good. "I come in at 7 just to get that part of my assignment ready. After I tried it with the kids, they had a lot of fun." Another teacher made a point of staying after the focus group to tell the researcher about an activity on rounding she had learned at TAMS and tried in her classroom. The teacher noted her amazement that something so simple as a number line could make such a difference in student learning.

While there was openness to attempts at implementation, the culture of Pizan was distrustful and negative. The school's history gave an early indication of problems. We learned that the appointment of the current principal in 1990 had led to a large portion of the staff leaving. Many of the current teachers are new to teaching and most are new to the school. Yet mistrust between faculty continued even into the 2003-04 school year. The principal expressed fear that teachers would take the TAMS Readiness training and then leave the school. He suggested that the teachers at the school don't communicate well and that racial tensions exist. The focus group with teachers revealed a feeling of negativity toward the principal. These teachers also stated that the Second Wave teachers in the building knew about the CMSI, but were "lazy" or "didn't care" so they wouldn't buy in.

The principal at Pizan saw improvements in the demeanor of those who attended the Readiness training, stating that they were more open to sharing with their colleagues about what they had learned. He also stated in June of 2004 that he would continue to support the CMSI in the school because it "will help us continue with staff development and training for the teachers and in turn it will build our students' math scores...and better prepare them for their future with math and science."

At the same time, however, the principal was sending the faculty mixed messages that promoted incoherence in the school. On the one hand the principal said he wanted his students to engage in higher order math, but he also said that test scores are the bottom line and that the main focus is reading. As a result, teachers felt pulled in multiple directions and were not sure where to focus. Similarly, in terms of commitment, the principal intends to support the CMSI if it looks like it is working in terms of test scores. Otherwise, the school will continue its primary focus on reading. At the same time, the principal's hands-off approach to leadership of the CMSI, leaves the Initiative to the teachers.

Teachers resented the decrease in the level of funds to support CMSI Readiness schools, especially when they heard at a TAMS Readiness session that teachers' raises were to blame for this. Without an on-site Specialist, our researcher at Caraway felt that the school had little hope of successful, deep implementation. Little leadership had emerged on the part of teachers in the building, and the principal continued to express distrust of teachers' intentions and skills. Lack of information about the Initiative was the rule and the poor lines of communication between the administration and teachers added to this. The principal's apparent lack of understanding of the goals of the curriculum is another problem for implementation, as he engages in observations and activities in classrooms that may be counterproductive to the goals of the approach. In short, researchers felt that deep implementation of the CMSI would be virtually impossible at Caraway.

⁸ We base this section on the 3 Readiness case study schools from which we have a rich amount of data. In the fall 2003 we also began working with a 4th Readiness case study school but were not able to collect enough data from this school to fairly discuss it as a case site.

Hattie Caraway Elementary

At Hattie Caraway principal turnover in the summer of 2003 led to the installment of a new principal who was not involved in the application to OMS and was unfamiliar with the CMSI. The new principal, focused on maintaining order in the school and getting to know her teachers. She admitted that the CMSI was not a priority for her. The teachers attending TAMS professional development expressed a commitment to the success of the initiative. These teachers, however, were concerned about the expectation that they would operate as models for other teachers in their school as they begin to implement the new curriculum and wondered whether TAMS professional development would prepare them for implementation. Teachers also wondered who would become their math Specialist (This was prior to their learning that budget cuts meant that they would not have a math Specialist).

In the spring of 2004, after budget cuts, the principal at Caraway was very angry and reluctant to talk to our researcher. There was a feeling among teachers that they had followed through on their commitment by attending the TAMS sessions and now their promised funding was gone. The principal wondered how the implementation could ever proceed without a person in the building devoted to it full-time. Without the material assistance, the Specialist position, and sub coverage for professional development, we anticipate low commitment to CMSI at this school. This situation is described more fully in the section describing the budget cuts below.

Katherine Hepburn Elementary

In Katherine Hepburn Elementary, a math Readiness school, teachers and administrators show a great commitment to CMSI. With input and commitment from teachers and other stakeholders, this school applied for IS status. Although Intensive Support standing was not awarded, the school welcomed the opportunity to participate in the Readiness stage as they saw this as giving them a year to better prepare for becoming an Intensive Support school. They looked forward to having the opportunity to learn about all of the other curricula so as to make a more thoughtful choice of curricula for their school.

Contrary to their hope, however, the staff at Hepburn was frustrated by the TAMS workshops because of what they perceived to be a lack of challenging content, a lack of information provided on the various CMSI curricula, and the inefficient use of workshop time. In addition, the administration at this school was frustrated that OMS wanted a February decision on which curricula the school would be implementing in the 2004-05 school year. The administrator complained that the need for this early decision seemed to defeat the purpose of the Readiness year as teachers had only participated in a few TAMS classes prior to this.

Despite these difficulties, Hepburn conscientiously tried to stick by their Readiness school commitments. The principal attended most of the principal meetings, participated in the external evaluation of CMSI, and utilized the help of the Area Math and Science Coach. Teachers attended TAMS workshops with a 98% attendance rate, participated in Math/Science Committee meetings, and as Math or Science Committee members went to Medill and to the CMSI Showcase to compare CMSI materials and make decisions for their school on what curricula to implement.

Because of this commitment to the principles behind the CMSI, this school intends to move to Intensive Support status even without OMS's provision of a Specialist. Despite the broken commitment from OMS for a Specialist for the 2004-05 school year, the school intends to go full scale. When asked what was behind the school's commitment to CMSI even in light of budget cuts, we heard from the administrator, "The teachers were investing in it. The Math Committee was invested in this. And this would be a good thing, and it (the alignment) would be done." This administrator was not going to succumb to the "This too shall pass" mentality often described in CPS. The CMSI is something that resonates deeply with this school. They are committed to it and will fight to keep it even if someone should come to them four years from now and ask them to give it up. They believe the curriculum is proven; they know it is good. They intend to provide math instruction in a coherent and continuous fashion from grade-to-grade.

As a result, Hepburn continued to make organizational and resource decisions to prepare for implementation. Grade level meetings are being coordinated to support implementation of the math curriculum and Hepburn got teachers on board by allowing them to get involved in the decision of which curriculum to choose to implement. Teachers were given the opportunity to explore materials, either in the TAMS Readiness workshops, the showcases or on trips to Medill.

Despite the enthusiasm about getting implementation going, there is a sense of disappointment and frustration that OMS/CPS cannot follow through on its budgetary commitments. The school is focused on making it work with or without OMS help: "We want it to happen. We are all on board—teachers, everybody who is here. We are going to

make it work with or without the Board...Just give us all the money that we have coming to us and leave us alone.” The principal expressed deep frustration that the money was pulled from the Initiative. “If you have an Initiative, then you need to fund it. And whatever you say, you still need to follow through on it. You can’t say one thing one day and then decide that you don’t want to do it the next. That’s not an Initiative.”

Hepburn displayed a strong commitment to participation in the Readiness program, despite their disappointment with TAMS Readiness training. Disappointment towards budget cuts, though discouraging and frustrating did not dissuade this school’s strong commitment to standards based instruction and the implementation of the CMSI with or without district support.

Factors influencing the experiences of Readiness Schools

Cross case analysis of our 3 Readiness case study schools suggests that the following issues are critical to the success and challenges experienced at CMSI Readiness schools.

- School infrastructure and culture
- Knowledge of and commitment to CMSI
- Professional development
- Teacher leadership

We review these themes below across the cases.

School infrastructure and culture

School reports indicate that school organizational and cultural variables presented a large, and at times insurmountable, challenge to implementation. For example, the change of principal leadership in one Readiness school in our sample provided insights into the influence of this transition on implementation of the Initiative. The new principal talked about the way in which being a new principal meant a need to get to know her teachers and school in a more basic way and that initiatives and programs were secondary to that process. When asked about her thoughts about what educational programs and approaches she would like to see, the principal responded by talking about subject matter not related to the CMSI. Thus, teachers participating in Readiness training at TAMS were disconnected from the goals of the school administration.

As was the case in the analysis of Intensive Support schools, a factor affecting the preparation for implementation was the school culture. The Readiness schools included in our sample were characterized by mixed trust among actors. For example, in Pizan, the principal was openly critical of his staff pointing to a lack of teacher confidence and expertise and talking about a fear that his teachers would take the training they received from OMS and leave the school. Teacher statements and behaviors reflect a similar lack of trust for this principal.

In Caraway, relations between the new principal and the teachers were far from trusting. Feeling the need to pressure the teachers to improve, the principal was coming down hard on the teachers. During one meeting the principal berated the entire staff, exclaiming that she knew some teachers were not happy with her and “they could leave anytime they wanted!”

Hepburn provided one example of how positive school culture made problem-solving possible. The strong, positive focus of school actors on keeping implementation on track despite budget cuts seem to be making moving forward a possibility.

Knowledge of and commitment to the CMSI

The second large barrier to Readiness schools was a lack of knowledge of and commitment to the CMSI. In Pizan, the teachers attending Readiness training and the principal lacked basic knowledge about the Initiative. Focus group data revealed that they did not know they were getting a Specialist, didn’t understand that they (the teachers receiving Readiness training) would be the only teachers in the school implementing the curriculum if the phase-in went according to OMS plans, and didn’t understand that the materials they were using at TAMS were the same ones they were choosing among for implementation at their school. In addition, teachers at Pizan did not understand that they were chosen to participate due to a successful application; they thought that it was a punitive measure taken due to low achievement.

I am very tired of these programs that get this money that hire these people for these programs to make more money than the teachers, and they don't do anything. And I'm speaking in context of that Reading Initiative program and if they have this Math and Science Program, get them out there and do something, other than just saying, you're on probation now so these people will be helping you

This school, however, was extreme. At other Readiness schools, misinformation about the initiative tended to be on smaller details. Caraway, lack of knowledge on the principal's part about the Initiative was due to her being assigned recently as principal. The First Wave teachers at this Readiness school, however, seemed to be well-informed about the initiative.

The Readiness schools in the evaluation sample showed varying levels of commitment to CMSI. Of the 3 Readiness schools in the sample, one was reported as having high levels of teacher and principal commitment to the CMSI and two showed high levels of teacher commitment with uncertain principal commitment.

A positive support to participation for Readiness schools was the knowledge of the resources they would receive when they became Intensive Support schools in 2004-05. Participation in TAMS professional development workshops not only benefited teachers in the curriculum exposure, leadership training and networking opportunities, it was assurance that the school would receive the resources allotted to Intensive Support schools—materials support and funding for a school-based Specialist to assist with implementation. This resource support was the impetus for Readiness participation. The budget cuts and resulting changes in the support of Readiness schools resulted in a disengagement on the part of some Readiness schools. This is discussed more completely in the section on the plans for 2004-2005.

In some respects, the loss of funding for Readiness schools in the CMSI marked a clear line between schools committed to the *principle* and schools committed to the *initiative*. Those committed to the principle of using standards-based approaches to improving math and science instruction determined that they would continue in this direction with or without support from the OMS. These schools used discretionary funds to ensure that class size would remain small in order to make implementation possible. They continued to work schedules such that teachers would have adequate prep periods and time to work together at grade level and cross-grade level teams for better alignment of curricula; they assigned “buddies” so that pairs of teachers could help one another in implementation, knowing there would not be a Specialist. Losses of funding seemed to make some teachers and principals in Readiness schools even more determined to make it work. “This is about our school, not the Office of Math and Science. What is best for kids knows no budget limits,” stated a principal in a Readiness school when asked about the effects of budget cuts.

Of the 3 Readiness schools we studied, only one fit into this category. Commitment to the principle was a strong support for Readiness school success in light of budget cuts.

Professional Development

By design, the TAMS professional development sessions were intended to be a support to Readiness schools as they prepared to become Intensive Support schools. Although teachers had mixed reports about the quality and content of the TAMS workshops, there was a high level of appreciation for having the time to meet with other teachers, both from their own schools as well as from others, to gain new ideas. While teachers did not always come away from TAMS training with complete information about the Initiative, the CMSI curricula or completely satisfied with the workshops, they did have a designated time to think and meet about math and science instruction and to think about and prepare for implementation of new curricula next year. One teacher at a Readiness school stated: “Although I was less than thrilled with TAMS training, it gave us a chance to think through implementation next year and to get to know one another and bond together.” In some cases, the new ideas they gained also gave teachers a chance to try out new activities and to “get their feet wet” in teaching standards-based math or science. In these respects, the TAMS professional development was an important support to Readiness schools.

Professional development support in Readiness schools was not just limited to TAMS sessions. At one Readiness school, a principal talked about Medill Professional Development staff who had been influential at the school. These two modeled lessons for the teachers and provided in-service opportunities. In addition, they set up connections between the Readiness school and another local school so the teachers from the Readiness school could shadow the experienced teachers.

Professional development was a key support for Readiness school teachers, especially in schools where the principal was reported as being less involved in the initiative.

Teacher Leadership

Another key support in Readiness schools came from the emergence of teacher leaders who helped to spearhead, coordinate and organize school participation in the Readiness preparation process. In Caraway, a teacher wrote the application to participate in the Initiative. This teacher provided reminders to the other teachers participating in TAMS training about upcoming sessions and attempted to call teachers together to meet between sessions. In Pizan, two teachers wrote the application for CMSI. One of these teachers has continued to function as the unofficial leader and coordinator of the teachers in the Readiness phase. She was highly involved in the selection of the teachers who would participate in the Readiness training and coordinated the communication between the school and OMS and among the teachers participating.

The emergence of this teacher leadership was a crucial aspect of the successful participation of Readiness schools. In schools without high levels of principal involvement or leadership, these teachers were sometimes the only link between the group of participating teachers and the OMS and TAMS. One teacher at Caraway praised the teacher leader in her building. "I honestly don't think we could have kept it all straight without her...the meetings, where they were, the expectations, all the decisions and curricula...She is the center of this thing".

Implementation Moving into 2004-2005

The CMSI strategy as originally planned was to use 2003-2004 to set the stage for a large scale up of implementation in 2004-2005. As planned, Intensive Support schools would have gone from implementation in one classroom per grade to all classrooms; Readiness schools would have gone from no implementation to a partial implementation in the context of a school better prepared to support the effort. All of these schools were to have (covered by OMS funding) a full-time Specialist on site, \$1,000 per implementing classroom for curricular materials, and summer and school year professional development for all implementing teachers including substitute teacher coverage and stipends.

As we have noted in this report, the implementation during the school year 2003-2004 was a little different than planned but for the most part followed the CMSI strategy. The schools received the planned resources though there were some problems mentioned in terms of the timeliness of materials arriving, some variation in how Specialists carried out their jobs, and some variation in teacher views of professional development and how well it prepared them for implementation and moving into 2004-2005. On their own accord, some schools decided to scale up implementation to include all of their classrooms in 2003-2004.

However, the CMSI plans hit a significant barrier in spring 2004 when the budget for OMS was cut due to serious budget shortfalls in the state, city and CPS. There were major budget cuts to all CPS departments—not just OMS. According to OMS leadership the cuts at OMS were proportionate to or less than the cuts in other departments.

The approved 2004-2005 CMSI budget protected the professional development offerings to all implementing schools and teachers—though only Intensive Support schools would get stipends for teachers to attend and substitute teacher coverage paid by OMS. The 2004-2005 CMSI budget did not cover any Specialist positions for Readiness schools who would begin implementing. Further, it cut from 100% to 50% OMS funding for Specialists from the higher achieving Intensive Support schools who were neither on probation status for 2004-2005 nor Math Science Cluster Schools. The Readiness schools and all Intensive Support schools had initially been told they would have Specialists at 100% for 2 years. Finally, another budget cut felt strongly by the implementing schools was the reduction of funds provided by OMS for curriculum material—from \$1,000 per classroom to \$800 per classroom.

Understandably, schools were not pleased to lose funding they were counting on for their CMSI efforts. Those Intensive Support schools who had to find funding for the other half of their Specialist positions, were deeply saddened by the loss of the promised dollars. One science Specialist expressed 'significant disappointment that it is not going to unfold as we thought.' She stated: 'I'm disappointed the Initiative seems to have shot itself in the foot in terms of credibility and sustainability, because some principals are asking why should I do this if I'm not going to get any support.' This Specialist felt that the Facilitator had been helpful in her school, but that OMS as a whole "does not think very far ahead, and is not very internally well informed. OMS personnel are themselves conflicted in their goals and at times unaware of this."

At one Readiness school, the principal was very angry about the budget cuts to the CMSI program and initially told the UIC CMSI Evaluation Project researcher that 'you are wasting your time and wasting my time' by asking her to talk

about the school's participation in the initiative. She said that without the district-funded Specialist, there was no way that the school could move to implementation in 2004-05. The principal stated that the incentive of the additional resources, through the Specialist and the classroom materials, was the primary reason that the teachers had decided to participate, and that the only way they would consider continuing with the program is if the money for a Specialist could be found. The principal at this Readiness school was not consoled by the fact that professional development would still be available for her teachers because sub coverage still would not be paid for. She said that her teachers already resented the amount of time they were asked to spend away from their classrooms and found that many of the training sessions were not worth the effort.

However despite their frustration over the cuts, the 2004-2005 plans at our case study schools show their resilience and determination. Of our 12 case study schools (9 Intensive Support and 3 Readiness) all of the Intensive Support Schools and at least 2 of the Readiness schools were making plans to continue implementing CMSI curricula in 2004-2005 and typically doing so at a scaled-up level compared to 2003-2004. Table D-5 offers a short summary of how our case study sites were planning for 2004-2005.

**Table D-5: Descriptive Grid of 12 Case Study Schools
—Looking at Preparation for 2004-2005 Implementation**

	Schools Facing challenges			Schools Finding successes						Readiness Schools		
	Stanton	Mead	Goodall	Chawla	Lange	Child	Ebadi	Makeba	Ocampo	Pizan	Caraway	Hepburn
Plans for 2004-2005												
Full or partial implementation in 2004-2005	full	full	full	full	full	full	full	full	full	full	unsure	full in primary, middle grades in later years
Plans to Support New Implementing Teachers	unclear	no plans	second wave already observing first wave spring	planning for more formal co-teaching	unclear	unclear	unclear	second wave already observing first wave spring	second wave already observing first wave spring	TAMS sessions, a teacher-leader organizing	unclear	TAMS sessions, principal organizing, creating extra cross grade prep for implementing teachers
Status of Specialist	100% funding from OMS	share 50% with other school	50% funds from OMS and 50% from school	100% funding from OMS	50% funds from OMS and 50% from school, but principal notes some control over defining role	50% funds from OMS and 50% from school	50% funds from OMS and 50% from school	50% funds from OMS and 50% from school	50% funds from OMS and 50% from school	none	none	none
# Teachers Attended Summer 2004 Prof Dev	5 to 10	< 5	5 to 10	5 to 10	5 to 10	5 to 10	11 to 20	21 to 30	21 to 30	0	0	5 to 10

In 8 of the 9 Intensive Support case study schools, the implementation of CMSI curricula will proceed with the support of a full-time Specialist at the school. Given their status as non-probation, non-Math Science Cluster, 7 of the case study schools were notified that OMS would only be paying for 50% of their Specialist. Six of these schools decided to reorganize their school budget to find a way to pay the other 50% of the salary and therefore keep their Specialist full-time working with their implementing teachers. This was especially challenging given that the OMS budget cut was not announced until after schools had created their SIPAA plans and worked with their Local School Councils to set their budgets.

Even though all but one of the case study Specialists will continue next year, the uncertainty that arose due to the budget cut took a toll on these professionals. In at least 3 of the schools that found school funding for a full-time Specialist, there was a period of time during the spring 2003 when the Specialist was unsure if they would have their job in 2004-2005.

The preparation for 2004-2005 at Intensive Support schools was in large part the responsibility of the Specialist. During the last month of the 2003-2004 school year, two major tasks of the Specialists were to sign teachers up for summer 2003 professional development and to plan the schools' budgets for curricular materials purchase. In our case study schools, we observed Specialists walking from classroom to classroom in order to personally talk to Second Wave teachers about signing up and attending the summer curriculum workshops. Specialists also spent a great deal of time figuring out how to stretch their budget dollars to supply classrooms with appropriate texts, equipment and consumable materials—given they now had \$800 per classroom compared to the \$1,000 per classroom they had anticipated. One determined Specialist was able to get some math story books included in various grant-funded literacy programs at the school and spent many hours figuring out where to find the best prices, discounts and free shipping for the supplies the teachers needed.

In one of the Readiness schools, the resources the OMS provided for their 2004-2005 was a great deal less than initially promised. However the commitment at the school to the goals of the CMSI was greater than this loss of resources. This school will move to full-scale implementation (at least as much as they can possibly afford—probably K-6; and then bring in Pre-K and/or 7-8 the following year.). The school anticipates difficulty without a Specialist to manage materials and assist teachers via co-teaching/observation and worries about the funding needed to pay teachers for summer and school year professional development training. If they had funding for one or the other, they would choose funding for the Specialist position over paying for teacher professional development training as they believe they can work something out with staff (like comp time) to find other than financial ways to reimburse teachers for their time. However, they will move into 2004-2005 with neither Specialist nor OMS funds for the staff professional development time.

While another of the Readiness schools will move to have all teachers implementing CMSI curricula in 2004-2005, the reason was less about commitment and more attributable to their probationary status as a school. They were being required to implement the CMSI curricula and had to reorganize their school funds to pay for the materials they needed to purchase. The teachers who had gone through TAMS professional development were somewhat enthusiastic about what they were learning at TAMS and the small lessons they tried out in their own classrooms in 2003-2004.

The third Readiness school we studied did not provide clear evidence about its plans for implementation moving into 2004-2005.

Summary, Implications and Conclusions

Summary

This report offers findings that address some key questions around which the evaluation of CMSI elementary school activities were built. Specifically, this report has addressed questions of:

- To what extent have the recommended CMSI practices been adopted and implemented in schools?
- How variable was the implementation across teachers and schools?
- By what processes did school development take place in these schools?
What supported or impeded development?

Across the 9 Intensive Support case study schools in our sample, all schools had full-time Specialists who were working with teachers using the CMSI curricula. More than half of these schools chose to have all teachers use the curricula, rather than only the 10 or so teachers that that OMS suggested as First Wave implementers. Not all of the schools were able to set up schedules for teachers that included both a full and contiguous 60 minutes a day for math and a common prep period for all grade-level teachers.

How schools and teachers implemented CMSI curricula varied. While most schools (6 of the 9) had at least one resistant teacher among those who were supposed to implement the new curricula, there were a few schools where we heard of no teachers refusing to use the curricula, resisting taking advantage of professional development or avoiding the Specialist's classroom visits. In all but one school, even the teachers working hard to use the CMSI curricula were supplementing the curricula with outside materials—typically traditional test prep materials. Within schools, we heard of teachers ranging from those struggling greatly with the new curricula and teaching strategies and those who were doing such a exemplary job that curricula specialists asked to video tape that teacher's classroom.

While there are many processes and factors influencing the success of schools' implementation of CMSI curricula, there appear to be some conditions more common in schools which are finding relatively more success than others. The schools more likely to be experiencing successes in implementation were more likely to have some teachers with experience teaching the curricula, positive experiences with professional development both within and outside of their classroom, strong principal support for the CMSI, some teachers serving as teacher-leaders, a school community with trusting relationships, and a good "fit" between the school and the Initiative.

In addition this report begins to offer insights into a larger question of the evaluation:

- Did strong implementing schools/teachers, more so than other schools:
-- improve student achievement?

-- develop essential supports?

Here our comparative analysis of case studies offers some hints as to how this question might be answered if a broader study were conducted. Based on our case studies we found that the stronger implementation schools (that we call “finding successes” schools) both related positively with improved student achievement on the ISAT and related positively with the school having important supports like strong principal support, strong trusting professional community, high quality professional development and coherence between CMSI and the broader school context. These relationships have not been shown to be causal nor do we know if schools beyond our case studies show these patterns. However, there is enough evidence and enough similarity between case studies and the population to suggest that further study may show that the stronger implementing schools improve student achievement and cause or are caused by strong facets of the school organization and culture.

Implications

What are the implications of these findings? Next we discuss implementation and make some recommendations on how to improve implementation efforts in the future. We organize our comments around the concerns of promoting CMSI curricula implementation that is spread widely across schools and classrooms and deeply within classrooms, that is “owned” by schools and teachers and that can be sustained for the long term.

Spread of implementation

The spread of implementation can be considered both at the system and school level. Here, we address the number of teachers in a given school who are implementing. Success of the Initiative is dependent on getting all teachers in any given school on board. The case studies presented in this report reveal teachers at various levels of commitment to the CMSI. Even in case study schools where all or almost all teachers are implementing the curricula, the First Wave teachers typically are more enthusiastic and better trained in using the curricula than Second Wave teachers. In this respect, if the goal is full implementation on the part of all teachers in the school, the Initiative has tapped the teachers most likely to engage in the type of practice required by these standards-based curricula. Those teachers who will join in the Second Wave are less likely to be as enthusiastic or as knowledgeable about the curricula.

An obvious requirement for spreading the implementation is to continue to provide professional development in the curricula to the teachers outside of the First Wave—Second Wave teachers, some of whom tried implementing in 2003-2004 and some of whom will try for the first time in 2004-2005, and teachers outside of Intensive Support schools. Certainly the OMS summer 2004 professional development for these teachers was a step in the right direction.

Yet, as important and key to the *spread* of implementation at the school level is the increased knowledge base and role of the principal, Specialist and First Wave teachers.

In this light, a principal who is knowledgeable in the curriculum being used and in methods of observing classrooms is critical for the continued spread of implementation at the school level. It is essential that the principal both supports teachers in CMSI principles and holds them accountable for implementation that has integrity. Similarly, Specialists need continued content training in the curriculum they are supporting. Specialists in case study schools were often as new to the curriculum as those they were mentoring. At the end of the year, one Specialist stated, “It is June and I finally feel like I have a limited understanding of what [the math curriculum] is getting at.”

At the same time, the Specialist role needs ongoing refinement. These role components must be communicated effectively and repetitively to principals, Specialists, and teachers. The range and depth of activities being done in case study schools by Specialists is wide. Often Specialist’s energies are being lost on roles not related to the CMSI. In addition, a number of teachers hunger for the depth of professional support that Specialists have the opportunity to provide as peer mentors.

Finally, First Wave teachers will find themselves called upon in 2003-2004 and beyond to offer support to new implementers given that the Specialist will be supporting a larger quantity of teachers and that the Specialist role may not be funded at the school after 2004-2005. Deepening the First Wave teachers understanding of the curricula is important in helping to spread implementation with the schools.

In summary, as the CMSI works to spread the implementation of curricula it would be well served to:

- Provide high quality curriculum training for new implementing teachers
- Provide and offer incentives for CMSI principals to receive training in the curricula at their school
- Provide additional curriculum training for Specialists
- Continue role development training for Specialists
- Provide high quality continuing curriculum training for First Wave teachers

Depth of implementation

When assessing the depth of curricula implementation, one considers how deeply and richly teachers and other staff understand standards-based materials and are able to use these materials in ways more expert than novice. The deepening of implementation is dependent on ongoing, quality and appropriate professional development training for implementing teachers. Teachers and Facilitators in CMSI schools state that there are important differences between teachers who attend regular professional development and those who do not. The message must continue to be given that *all* of those involved in CMSI implementation--new teachers, experienced teachers, principals and Specialists--need ongoing, continued learning to deepen their implementation. In this vein, promoting the continuing deepening of the Initiative is dependent upon tailoring professional development to groups of teachers, principals and Specialists so that it is appropriate and useful for these groups and the various levels within them.

Two of our case study schools are stories of experienced teachers who felt that they should be able to choose professional development options better suited for their more experienced skill and expertise level. Addressing the concerns of these teachers, and convincing them that training is relevant, useful and, in fact, essential to their continued growth will be an important aspect of creating professional development options that appeal to different populations while preserving the integrity of what is offered.

In summary, we make the following recommendations to OMS as they work to increase the depth of implementation:

- Conduct brainstorming sessions with professional development providers, vendors, principals, teachers and Specialists, about the continuing professional development needs of these groups
- Create flexible and evolving structures and incentives for professional development that address expressed teacher, Specialist and principal needs

Ownership of implementation

Promoting ownership of the Initiative is, in many respects, a prerequisite to the spreading, deepening and sustainability of implementation. Until teachers take these materials, and the ideas and concepts behind them, as an integral aspect of their thinking and pedagogy, spread, deepening and sustainability are not likely. In our case study schools, we see varying levels of ownership for the Initiative and the materials it supports.

The key to continued development of ownership and the spread of implementation to Second Wave classrooms is leadership training for First Wave teachers and their mentoring and support of Second Wave teachers. This mentoring of Second Wave teachers by First Wave teachers will require some creative solutions for scheduling, but we believe First Wave teachers will deepen their own commitment to the Initiative as they share their success and struggles with peers.

Specialists and teachers at three of our case study schools made reference to hoping that First Wave teachers would be able to help to support the Initiative. However, in each of the three cases, those interviewed did not know how to design structures to make that possible. Barriers of the full teaching load of First Wave teachers and a lack of ideas of how to design fruitful mentoring structures kept the idea of First Wave teacher leadership in the spread of implementation simply as that—an idea. Creative suggestions and solutions about how to make First Wave teacher leadership feasible and possible need to be gathered and circulated to CMSI schools to make this a reality. It will not happen in most schools without help, guidance, support and gentle pushing from OMS.

In summary, our recommendations for developing teachers ownership for the CMSI and for the curricular materials include the following:

- Conduct a strategic planning session to consider creative ways school have and might foster their First Wave teachers' abilities to mentor new implementing teachers—and then share findings and recommendations
- Reconfirm the importance of common grade level prep periods as occasions of developing a strong supportive teaching community

Sustainability of implementation

Sustainability of implementation refers to the development of an ongoing commitment to the standards-based approach in math and science teaching and the use of research-based curricula, with or without an Initiative, with or without support from the OMS or any other outside assistance. After just one year of implementation, we have only limited insights into what it will take to sustain implementation long term. However, it is clear that even keeping the implementation going in 2003-2004 with strong resources from OMS took a high level of support in terms of training sessions, in-school/in-classroom professional development and feedback, and logistical management of materials. It appears to be critical that continued strong support needs to come from the Specialists, Area Coaches and Facilitators. These providers of hands-on outside expertise need to help to create structures and supports within the schools and confident teachers skillful with these curricula so that schools eventually become independent in their ability to implement the CMSI vision and use well the research-based math and science curricula. While eventually the Initiative needs school leaders in charge, it appears clear that more than one year of strong district support is needed before this will happen.

In addition, we note that the CMSI is battling a culture in CPS where administrators and teachers live by a saying of “this too shall pass” in regard to the many initiatives that come and go over the years. At the start of 2003-2004, we heard many staff at our case study sites talk about how different and better the CMSI seemed from the typical passing CPS initiative. However, at the end of the year, after disappointing budget cuts, there was a great deal of disillusionment. Despite this disillusionment, most schools appear poised to move into an increased level of implementation in fall 2004. Still, it is important to note that the perception of the Initiative in this context of “this too shall pass” needs to be monitored and addressed by the top levels of CPS leadership.

In summary, we make the following recommendations to CPS to facilitate the sustainability of the CMSI:

- Continue supporting strong outside hands-on support to schools by OMS Facilitators, Area Coaches and other curriculum team members so that through their mentoring schools develop long-lasting structures within
- Strategically plan how to support schools beyond the second year of implementation
- Monitor the perception of the CMSI by administrators and teachers and develop CPS district leadership strategies to avoid short term approaches to an initiative that needs a long term plan for support

Conclusions

When interviewed in February 2004, the OMS Staff and Facilitators came up with many ideas about how various CMSI stakeholder groups needed to take action in order to improve implementation as they moved into 2004-2005. The insights they shared were summarized by the UIC CMSI Evaluation Project and then distributed back to the Office of Mathematics and Science in a “data memo” in late February, 2004. It is clear from this document, that OMS staff members have the wisdom internal to their group to continue to strongly support the CMSI implementation. In many ways, the recommendations we make in the section above on implications and recommendations based on our data and analysis are the same as the ideas in the minds of OMS staff in February.

For example, in February 2004, OMS staff spoke of issues we mention above related to the spread of the implementation. They noted the importance of the knowledge base and role of the principal, Specialist and First Wave teachers. OMS staff talked about the importance of providing and making mandatory principal training in CMSI curriculum content. OMS staff puzzled in interviews about the best way to use Specialist time and about their wish that OMS be involved in selecting Specialists with the kind of skills that would best support implementation, knowing that the initiative could not make its way into resistant teachers’ classrooms without a highly skilled Specialist. OMS staff knew that First Wave teachers needed to be mentors to the Second Wave and knew that the Specialist could not support a whole school at full implementation. In interviews, OMS Staff talked about the need to provide these First Wave teachers with leadership training.

Related to supporting the depth of implementation, OMS staff interviewed talked about the need to provide training that addressed practical needs. Science Facilitators recognized the difficulty teachers experienced in knowing how to begin to organize hands-on science and talked about the value of providing training in this. Two math Facilitators talked about the need to tailor curriculum training to the levels of expertise and knowledge of attendees, to make it more relevant to experienced users and to express the value that there is always something to learn, regardless of one’s level of knowledge about the program. We concur with the Facilitator who said, “What we need to think about is how can we

provide training that everyone—teachers, Specialists, principals—go home saying ‘that was exactly what I needed.’ Maybe that is a high goal, but that is how we keep them coming, right?”

We cannot think of a more suitable way to conclude this report than to call attention to the insights to the challenges of implementation that are already in the minds of and discussions among the OMS staff. Perhaps the most essential key to the spread, depth, ownership and sustainability of the Chicago Math and Science Initiative is for the OMS staff to continue to work to develop evolving structures, supports and time to listen to each other. Within the OMS Staff are people with the knowledge, experience, vision, and foresight to create solutions to the inevitable set of challenges to the Initiative. Finding ways to utilize this wealth of the OMS collective and to communicate better with all staff (Lead Team, Facilitators, OMS Staff, Coaches, Specialists, etc) more frequently and more efficiently, will be crucial moving forward.