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

Report C: Professional Development & Showcases

A report to the
Chicago Public Schools
Office of Mathematics and Science

August 30, 2004

By the
UIC CMSI Evaluation Project
University of Illinois at Chicago

Sara Ray Hallman
Carol R. Fendt
Stacy A. Wenzel
Sabrina Billings
Amanda Fields
Isabel Nuñez
Rose Sweeney
Jianying Yan

For further information,
contact Stacy Wenzel at swenzel@uic.edu.

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 report, 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 and the 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 academic 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.

This report, Report C, describes and analyzes CMSI professional development offered to Specialists, Intensive Support First Wave teachers, Principals and school personnel throughout Chicago Public Schools. Data indicate a commitment to ongoing, quality professional development for Intensive Support school actors. In addition, there is evidence that the OMS is making efforts to offer information about standards-based materials to all schools in the system. Barriers to professional development efforts include the unevenness in quality and format of some workshop sessions, the relevance of subject matter in some sessions, logistics and participant needs.

Overview of the Implementation Reports

- Report A: Data, Methods & Overview
  - Introduction
  - The CMSI Elementary School Plan: An Overview
  - Evaluation Methods
  - Description of Reports B-D
  - Implementation Series Executive Summary (Reports A-D)
  - References for Reports A - D
  - Attachments
  - Descriptions of Women (Pseudonyms)

- Report B: The Specialist Report
  - Report B Executive Summary
  - Introduction
  - Selection
  - Role
  - Specialist View of Their Role
  - Other Stakeholders' View of the Role of Specialists
  - Specialist Concerns
  - Development of the Role: Case Study Data
  - Conclusions

- Report C: Professional Development & Showcases
  - Report C Executive Summary
  - The Training of Specialists, 2003-04
    - Specialist Summer Training, 2003
    - Specialist School Year Training, 2003-04
    - Specialist Summer Training, 2004
  - The Training of Teachers, 2003-04
    - Summer Training for First-Wave Teachers, 2003
  - OMS Principal Meetings
  - Analysis of TAMS Readiness Training
  - Curriculum Showcases
  - Conclusions

- Report D: Exploring Implementation: Intensive Support & Readiness School Stories
  - Report D Executive Summary
  - Introduction
  - Intensive Support Schools
    - Descriptive Vignettes of Intensive Support Schools
    - Extent and Variability of Implementation at Intensive Support Schools
    - Factors Supporting Implementation at Intensive Support Schools
  - Readiness Schools
    - Descriptive Vignettes of Readiness Schools
    - Factors Influencing the Experiences of Readiness Schools
  - Implementation Moving into 2004-2005
  - Summary, Implications and Conclusions

Report C: Professional Development & Showcases
Table of Contents

Report C: Executive Summary

The vision of the CMSI is based on the building of a strong workforce and sustainable infrastructure in math and science in the Chicago Public Schools. In the minds of the creators and leaders of the OMS, the building of this strong work force depends upon ongoing meaningful and high quality professional development for all who are implementing the CMSI. This report considers the professional training of Intensive Support math and science Specialists from the summer of 2003 through the summer of 2004; the training of Intensive Support First Wave teachers from the summer of 2003 through the spring of 2004; OMS meetings with Intensive Support principals during the 2003-04 school year; TAMS training for Readiness school teachers; and the Curriculum Showcases offered by OMS. These training sessions are considered both descriptively and analytically, providing an overview of the content and quality of observed sessions and collected materials.

Evidence suggests that Specialists received high quality and ongoing professional development throughout their first year in the Initiative. Early training provided guidance in leadership, on standards-based curricula, in educational technology and on their role. School-year and summer 2004 training provided further leadership training and a deepening in knowledge of CMSI-approved instructional materials. Training was seen as high quality by participants, although the timing and approach to it was critiqued.

The training of teachers in the summer of 2003 was described as having mixed quality depending on the providers. The logistics of training were challenging and teachers had mixed experiences. High levels of concern about the curricula and about teacher roles were common among teachers. School-year professional development for teachers revealed concerns about the effects of scale-up on the quality of professional development and about the different needs of various populations of teachers receiving OMS professional training. Data collection of teacher professional development in 2003-04 showed high quality professional development but also revealed issues related to scale-up and session organization which need further study and thought.

Principal training was focused on the role of principals in supporting the implementation of CMSI curricular materials and in highlighting the experiences of CMSI schools. The strong content and focus of the principal meetings were their strength; however, the low participation of principals was a barrier to their effectiveness, as was the lack of development of specific observation and implementation monitoring tools, and the lack of exposure of principals to the curricula.

Analysis of TAMS Readiness professional development revealed strengths and weaknesses in the training. The training encouraged participating teachers to try standards-based activities in their classroom during the Readiness year, and interviewed teachers were very positive about this. The pace, format and relevance of sessions and the approach of workshop instructors were criticized, however.

Offering the opportunity for CPS schools in OMS-supported standards-based materials was seen as a success by organizers, participants and observers. The showcases met the goals of providing opportunities for school teams to learn about research-based instructional materials in math and science, supporting school teams in discussion and planning for effective selection and implementation of the materials and providing opportunities for school teams to discuss and reflect on professional development and articulation across grade levels.

In conclusion, evidence suggests high quality professional development offerings for all leaders in the CMSI, with some suggestions for improvement in quality, format and organization. An increase in accountability and involvement of principals is suggested and a refinement in the professional development offerings for teachers is recommended.

Specialists

We begin with the Specialist training. As school-based leaders in implementation of the CMSI and as the local school actor most involved in the Initiative, Specialists played an essential role. Tracing the professional training they received provides insight to the expectations of their role on the part of OMS staff and Specialist reflections on the training presents information about the understandings on the part of Specialists.

Specialist Summer Training, 2003

At the beginning of their job, in summer of 2003, the Specialists were provided with two weeks of intensive training. The Specialists received approximately 60 hours of training in ten days. An analysis of the training calendar shows that the time was divided across leadership training, exposure to standards-based curriculum, training in educational technology, an overview of the role of the Specialist, and a consideration of the role of parents in the CMSI. Table C-1 provides the specific distribution of topics covered. After describing the topics covered, we offer the Specialists' reflections on the quality of the summer training sessions.

Table C-1: Topics Covered During Summer 2003 Intensive School Specialist Training Sessions

Topic	% of 60 hours	
Leadership Training	48%	(Approx. 29 hours)
Standards-based Curriculum	23%	(Approx. 14 hours)
Educational Technology	21%	(Approx. 13 hours)
Role of the Specialist/CMSI	5%	(Approx. 3 hours)
Parents	2.5%	(Approx 1.5 hours)

Leadership Training
A little less than half of the training hours were spent working with Al Bertani and Betty Sandifer, professional development experts from the Chicago Public Schools Office of Professional Development (OPD). The standard arrangement was to have a 3.5 hour session in the morning devoted to sessions conducted by OMS staff or curriculum experts and then to spend the 2.5 hour session after lunch with the Office of Professional Development. OPD training topics included community building among Specialists; change management; adult learning; cognitive coaching; and facilitation, collaboration, and leadership skills.

Bertani's sessions are well-known in Chicago Public Schools and throughout school reform arenas in Chicago. An illustration of the leadership training sessions comes from an evaluation team observation that took place on July 21st, the first day of Specialist training. Bertani led several activities throughout the day. One asked small groups to talk about their experiences in a high-performing group, reflecting on the common characteristics in their experiences. He then linked the characteristics to literature on high performing groups. Another activity involved viewing a videotape of a Chicago Public Schools principal leading a meeting at her school followed by small group discussion around the leadership style of the principal. OPD activities also involved the reading of research on leadership and professional development, asking small groups to read different pieces of an article and bring together the elements of their learning.

The leadership training spanned a wide range of scholarly, professional and technological materials. As Bertani noted in his presentation to Specialists, the goal of OPD, the ultimate goal of professional development, is to improve student learning by helping educators to develop deeper content knowledge, expand their instructional repertoire, integrate technology into daily work and strengthen assessment skills.

Standards-Based Curriculum Training
Roughly 23% of Specialist training time was devoted to learning about standards-based curriculum. As the leaders at the school level for the implementation of standards-based curriculum, the training aimed to educate Specialists about standards-based approaches to math and science, both generally and in the form of specific curriculum being supported in the CMSI.

The consideration of standards-based curricular materials began with a session by OMS Executive Officer Marty Gartzman who led the Specialists through a morning of considering what standards-based math and science looks like in general. Gartzman presented videos of CPS classrooms and facilitated discussion about the teaching practice. Three other mornings of the Specialist training were then spent exposing the Specialists

briefly to each of the math and science instructional materials being utilized in the CMSI. Teachers and curriculum experts were each given between an hour and a half and two hours to provide Specialists with an overview of the curriculum.

Educational Technology Training
Specialists were provided with laptop computers and projectors to make professional development presentations. One morning session was spent distributing these materials and providing Specialists with an overview of how to use the equipment.

The remainder of the time spent on educational technology was focused on the use of Lesson Lab, described by OMS staff as "an online collaboration portal for teachers and teacher leaders" (Specialist training observation, 7/28/03). The Lesson Lab is a library of video clips of teachers teaching. Lesson Lab focuses participants' attention on praxis by asking participants to closely observe lessons noting teacher and student behaviors. Specialists were given access to the Lesson Lab and training in how to use it. This took approximately 20% of the workshop time.

Discussion of the Role of the Specialist within CMSI
One morning of the ten-day training was spent familiarizing Specialists with the CMSI and providing an overview of what their role might entail. The overview of the CMSI was given through a series of interactive sessions that allowed Specialists to explore their own understandings of the CMSI and compare it to the reality of the programming. Specialists and OMS Facilitators interacted in meaningful ways during these sessions as Specialists generated lists of their understandings of the facts and facets of the CMSI. In addition, Facilitators addressed misunderstandings and responded to questions. A team of three Facilitators also led Specialists through an activity to introduce them to the "many hats" they would be wearing. This included a role playing activity, where both Specialists and OMS Facilitators practiced roles of individual mentor, team builder, program developer and policy maker. This was followed by a question and answer session in which Specialists raised specific questions about their new role.

Discussion of Parents
A portion of one morning session, approximately 1.5 hours, was spent discussing the role of the Specialist as it related to parents. Specialists were introduced to resources that could assist them in communicating with parents about the use of standards-based curriculum and parent-child and parent-school relations.

Specialist Reflections on their Training
On the first day of their two-week training session, evaluators asked Specialists to write down some of their hopes, concerns and expectations.[1] Specialists came in with high expectations for their two weeks of professional development prior to their job beginning. They expected to learn about their role and to gain the tools to do their jobs. One wrote the following:

> I hope to gain skills for creating a dynamic, effective team to produce meaningful, positive change in my school. Specific tools: structuring professional development experiences that are engaging and productive, approaches to presenting new information and ideas to a diverse group of teachers with varying levels of commitment and the skills of building cohesiveness and resolving conflicts.

Understandably, on that first day of the training—their first day in the newly created job of Specialist—they also expressed concerns. Concerns focused on several main themes: the new job, a new personal challenge, working with teachers, curriculum, materials, school administration, time, the long term, and success for all students. In Table C-2, we illustrate these concerns with some examples from participants' written responses.

[1] On the first day of the workshop, 44 Specialists consented to participate in the evaluation study and answered the following 3 questions: (a) What do you hope to gain from this workshop (over the next few weeks)? What do you expect this workshop can provide you with in terms of the tools/skills you need to perform your job? (b) What are your main concerns as you start your work in the Chicago Math Science Initiative (CMSI)? (c) What questions do you want answered about your work in the CMSI? What kinds of support would you like to receive?

Table C-2: Illustrations of Initial Concerns of Intensive School Specialists on their First Day on the Job

Themes	Examples from participants' written reflections
New job	What are my job responsibilities? What is expected of me? How will I be assessed? What results am I expected to produce? What will my work day look like? To whom do I report? Is there a clear job description that has been communicated to the schools and agreed upon by all parties involved?
New personal challenge	Will I be competent, effective, and willing to stick to the standards that are a large part of this initiative? How can I stay focused and organized for the task at hand? As a Specialist in a new position, I hope that CMSI will be patient as I will be learning along the way and will make mistakes. How can we prevent "intellectual overload?"
Working with teachers	How do I best facilitate, coach or partner with my teachers? How do I get teachers as excited about this as I am? How do I foster teacher buy-in? How do I work with "difficult cases"? My main concern is that this will be overwhelming and not widely accepted at my school. How well will my colleagues respond to me being placed in this position, and how well will I motivate and persuade them to reform? How will I get teachers to cooperate together? How much professional development will I support for groups (for the whole school and for lead teachers) and how much for individuals?
Curriculum	I need to become more familiar with the new math or science curriculum so I can guide teachers at my school. I'm concerned about knowing 9 levels of content: grades K - 8.
Materials	Will I have all the information and materials I need at the beginning of the school year? Concerned that doesn't understand CMSI selection of curriculum: I want to know why some math books were excluded from consideration as part of the Initiative. Also I want to know the criteria used to exclude certain math books.
School administration.	How can I make sure our administration is fully aware of their role as part of this implementation team? How much input does the principal have in what we are to do? Is the principal willing to allow this position to work in its capacity?
Time	How can I find time to do all of this work during the school day? If after school meetings are needed, how do we make this work when they are not budgeted? How will teachers have enough time to commit to the program? How much time outside of my normal hours will be required? Concern about how much time schools will be given to reply to requests for information.
The long term	How will CPS support this Initiative after two years?
Success for all students	Will the materials [used to] teach our students actually raise student scores. How much time will I spend with students? Will all students be served equitably?

Specialists were also asked to write about the supports they thought they would need as they moved into their new role. Specialists hoped that there would be regular workshops, networks of people to help them, someone to field questions, someone to support curriculum implementation and to assist with professional development, principal support, and technology and computer support.

At the end of the ten-day summer training session, participants were asked to reflect back on their experience.[2] Specialists' responses to what they gained from the training clustered around four main themes: staff development and professional development techniques, leadership and coaching skills, contacts and networking information, and exposure to the CMSI standards-based programs. One Specialist commented on staff development and professional development techniques in this way: "This was the best professional development I ever had. I learned new people skills and professional development skills." Similar comments identified specific professional development techniques that Specialists thought they would use in their work.

[2] On the last day of the workshop, 42 Specialists consented to participate in the evaluation study and answered the following 5 questions: (a) What skills/tools/insights did this workshop provide you with to assist you in your position within the Chicago Math and Science Initiative? (b) What are your main concerns as you start your work in the Chicago Math and Science Initiative? (c) What was the most important thing that happened during this course/workshop? Please explain why and what connection this might have to your position within CMSI. (d) What would have made this workshop more beneficial/useful? (e) Through the course of this workshop, how has your relationship with fellow Specialists changed or developed? Please describe.

In terms of leadership and coaching skills, one Specialist wrote, "The training provided me with coaching tools: body imaging, tone of voice, inflections." Specialists appreciated the chance to make contacts with other Specialists and to work with OMS Facilitators and Area Coaches. One Specialist wrote, "What I appreciate most is the opportunity to network with and become friends with peers."

Not surprisingly, Specialists continued to have concerns even after the ten days of training. These concerns were focused on role development, time constraints, teacher resistance, principal and OMS support and the coordination of materials. In terms of role development, Specialists were concerned that their time would not be protected to support curriculum implementation. One Specialist stated, "My main concern is that I will actually get to be a Specialist, not a sub, in the building." Worries about time were expressed in two ways: as concerns about having enough time in the school day to perform duties and as a concern for how much time the position would take outside of the school day. "Will I have enough time to get everything completed?" one Specialist wrote. "My main concern is the amount of time I'll need to spend outside the work day," stated another.

By far, Specialists wrote that the most important thing they gained through the workshop was the chance to network and collaborate, leading to the generation of lists of people who could be counted on ("I know who to contact when I need assistance") and a feeling of not being isolated ("Knowing that everyone is in the same boat!").

Specialists were universally positive in their comments about the development of relationships with their fellow Specialists. They commented on a sense of community that had developed among the group, useful for the sharing of material and emotional resources. One stated

> At first there was a low level of comfort/trust not knowing how to interact with the people at the table. However, as time passed the comfort/trust is high. Using jigsaw activities enabled me to meet, discourse and exchange ideas. The networking is great! I have met a variety of people with a vast amount of experience and expertise which can enhance/develop my learning.

Specialists also talked about how the training assisted in the transition into the new role. "The summer training, that long two-week summer training, was supportive in a sense that it gave me the sense of shifting my perspective away from a more classroom-based focus to a more administrative base."

Comments complimentary of the leadership training were common, as were criticisms of the lack of training on the curricular materials. One science Specialist in a case study school remarked that the leadership training was excellent; however, because of the autonomy of teachers in her building, she work primarily one-on-one with them. Instead of leadership training, she wished she'd had more training on materials. "They trained us in people skills over the summer. We did a lot about how to provide professional development, and how to effectively mentor people, coach people…However, I find that relatively little of my time is spent one-on-one dealing with those individual teachers. … My day is spent on all kinds of other things."

Another suggestion of how the training could have been more useful focused on time allocation. Specialists longed for more time to talk about and get a feel for their role; many specifically mentioned role playing. They were complimentary of the new skills they received in leadership and coaching but wished they had been given more time to practice their new skills. "More time was needed to use newly learned skills: how to coach, model, team teach." Other Specialists wished that more time had been devoted to learning about the instructional materials they would be implementing in their schools. "I would have liked more time to look at materials before seeing them with our teachers in August."

In addition, many Specialists believed training would have been stronger if it had been stretched across a longer period of time, perhaps making room for the increased focus on "trying on" the Specialist role—with deeper exposure to instructional materials and time for individual, school, or Area planning. "There was too much information to absorb in a short period of time," one Specialist wrote. "I wish we could have had a ½ day to do uninterrupted planning and brainstorming with just my team," wrote another.

Specialist School Year Training

Throughout the 2003-04 school year, Specialists met twice a month to receive training from the Office of Mathematics and Science. The goal of the staff of OMS was to provide one six-hour session per month devoted to training in CMSI-specific curricular materials and one six-hour session devoted to leadership training and trouble-shooting around the Specialist role.

Agenda for twelve of the Specialist sessions across 2003-04 were analyzed and coded for content. The content is summarized in Table C-3 below.

Table C-3: Topics Covered During 2003-04 Intensive School Specialist Training Sessions

Topic	% of 12 sessions
Leadership training	30%
Administrative housekeeping	30%
Standards-based curriculum	25%
Specialist problem solving (content/whole group)	12%
Other	3%

Leadership Training
Approximately 30% of the 12 sessions was devoted to leadership training. This training focused on peer problem-solving as well as on more formal presentations on building leadership skills. For example, Specialists were given time to work in small groups to talk about leadership challenges they were experiencing and work together to solve them. In a different session, Specialists were given illustrations of the characteristics of strong leaders and asked to apply them to their work in schools.

Administrative Housekeeping
Approximately 30% of the 12 sessions was spent on administrative housekeeping. For example, Specialists were given a presentation on how to fill out forms about the materials they were ordering for 2004-05 and instructions on how and when to submit data. At another session, Specialists were given an overview of possible budget cuts and how this would affect their role and the implementation of the CMSI in their schools.

Standards-Based Curriculum
About ¼ of the 12 sessions was devoted to the consideration of standards-based materials. In some cases, these sessions included attention to specific units and lessons while in others, a very general consideration of standards-based materials was taken. The goal of the presentation of the standards-based materials tended to focus on increasing and deepening Specialist understanding of the standards-based approach and of their role within it.

Specialist Problem-Solving
Approximately 12 percent of the 12 analyzed sessions were spent in Specialist problem-solving sessions. These were either whole group, with all Specialists present, or content group (math and science Specialists separate) organized and focused on the sharing of Specialist and Facilitator knowledge to solve role and implementation problems.

Other
A small percentage of time in the 12 analyzed sessions was spent in "Other" activities, primarily individual work and reflection time.

Specialists Reflections on School Year Training
In a written reflection administered by external evaluation staff in February, 2004, Specialists were asked to reflect on the training they were receiving from OMS and to identify the parts of the training most useful in their work with teachers.[3]

Specialists were most thankful for the exchange of ideas and the time to brainstorm and network with other Specialists (N=22 of the 43 responding Specialists noted this). "Networking and talking with other specialists

[3] Forty-three of the 77 Specialists participated in this written reflection.

can be very useful," one Specialist wrote. "It is helpful to find out things that are going on at other schools to help find ways to improve implementation at my own school." Some Math and Science Specialists wished they had more time to meet in Math and Science specific teams (N=10). Specialists also appreciated the chance to meet with Facilitators and OMS staff (N=17).

Respondents were positive about the leadership skills and training they received. They felt this training had assisted them in developing a good rapport at their school (N=10). Training in coaching gave some Specialists more confidence in their mentoring skills (N=13). "Training has provided a better feel for the type of questions to ask teachers in post-classroom meetings," one Specialist wrote. Similarly, Specialists were thankful for the articles and other materials they received in training sessions on co-teaching, leadership, coaching, standards-based curriculum, and family nights (N=13).

Specialists were generally very positive about the curriculum training they received (N=25 of the 43 responding Specialists noted this). They noted as especially useful the learning of activities across grade levels and the previewing of lessons that teachers would be using soon in their school. "I like the fact that we engage in activities from units that the teachers have not covered so that we can better assist them when they get to them," one Specialist wrote. On the other hand, several Specialists noted that the introduction of specific units or lessons from the curricula gave a good general feel, but was less useful for work with teachers because there just wasn't enough time to cover enough lessons (N=11). In terms of suggestions for professional development topics, Specialists wrote about the need for insights into how to prepare First Wave teachers to assist with the Second Wave, and ways to convince teachers that the standards-based approach would lead to test score gains (N=7).

Observations and Specialist reflections indicate high levels of positive feelings about school-year professional development training. Three major criticisms of school-year professional development emerge from this data. In the first place, Specialists felt that too much time was spent on "housekeeping" rather than leadership and content training. "I think if I had gone in expecting that time was going to be spent on paperwork, I would have thought about it differently," one Specialist wrote. "But if you say we are doing leadership and content training, that is what I expect to get, not paperwork." Ten Specialists had similar comments. Secondly, a group of Specialists expressed that they wished they had been able to meet in content-specific groups more often. Primarily, these were science Specialists who longed for more time together. "I know we are one big group," wrote one Specialist, "but science is different in some ways, and we need time to address our content-specific issues." Fifteen Specialists mentioned this as a criticism. Finally, Specialists wrote about wanting more time to talk together—to problem solve—and wanting greater involvement in agenda-setting for the meetings. "Don't tell me what I need," one Specialist wrote. "I should be telling you what I need. We need a seat at the agenda-setting table."

Specialist Summer Training, 2004

Observations of three days of professional development for Specialists at TAMS in late June and early July show varying levels of utility in the training itself, as well as of engagement by the Specialists. It is useful to explore what worked and why in these sessions, as well as what was less effective. From these examples, it appears that professional development was more relevant when directly addressing the challenges that Specialists faced during the school year.

The first observed Specialist professional development session, presented by OMS staff, was less directly related to the work of the Specialist. The whole day was devoted to exploring the variability of student learning and reasoning styles. Many of the Specialists felt that this was not new information for them. Specialists did comment that not all their teachers understood how much kids differ in their thinking, although they thought a better way to address this topic may have been explicitly equipping the Specialists with a way to share this understanding with their teachers.

This seemed to be the approach taken by Al Bertani and the Office of Professional Development in the subsequent observed sessions. Presentations on our second day observing focused on the challenges that the Specialists faced in their schools, such as teacher resistance. The value of this topic was so powerfully recognized that one Specialist responded with anger saying, "They [OMS] should have talked about resistance and what to do about it earlier…I could really have used it last year." The participants were given practical tools for addressing this problem and were given the opportunity to discuss these in the context of real-life case

scenarios. Specialists' talk flowed easily into the particulars of their schools, sharing useful advice and encouragement. The next session we observed was on assessment and was poorly received by the Specialists since they did not seem to understand the need or purpose for developing new assessments. Specialists suggested that the feedback questions used at the close of the meeting would have been better utilized had responses to them been collected in a previous session and used to plan the presentation itself.

The third session observed produced a mixed reception. The opening group activity reviewed the previous day's work on overcoming teacher resistance. As noted above, this is an immensely useful area in which to develop Specialist competence—every Specialist benefits. However, the next part of the program showed less understanding of the immediate needs of the Specialists as it focused on the development and evaluation of effective professional development, and Specialists have yet to feel competent in securing opportunities to present professional development to their school. When this concern was raised, the response was to "get political," but this phrase was not illustrated or explained. It seemed that the Office of Professional Development knew about and prepared curricula around the problem of resistant teachers—a laudable and beneficial approach. However, the presenters were challenged by unexpected constraints on the Specialists' freedom to develop and present teacher training.

In addition to these conclusions, it is also important to mention a few issues raised in the observations that do not involve the quality or type of training offered, but nevertheless impact the Specialists' experience of and benefit from the sessions.

In the first observed professional development day, Specialists were asked to begin by brainstorming some goals for the sessions. Instead of doing this, one of them raised the question of how they would be compensated for the training, as they had apparently heard conflicting messages. Despite the fact that the rest of the group clearly shared this concern, the situation was not explained satisfactorily before the Specialists were directed to the day's tasks. This is probably not the main reason why this was the least successful of the three days observed, but it seems logical that Specialists who may have reason to mistrust OMS on financial issues and have not had their concerns addressed, may be less focused until those issues are openly resolved.

Some of these professional development days included Specialists, Coaches and OMS staff. As this working together more as a team becomes the norm, perhaps the strong community of Specialists will grow to include these other actors as well. It is our hope that this larger group can develop the same willingness to share and learn from each other and that all players will benefit from the additional voices and realms of experience that will be brought together. Gains will by no means be limited to the Specialists, but will accrue to CMSI as a whole.

Specialist Training Considered

Data suggests that Specialists were given consistent, ongoing, high-quality professional development training during 2003-04. Specialists were given meaningful training on leadership, materials, technology, and their role. They were given time to work together and to solve problems. This type of ongoing support and training is to be commended. Missing were opportunities for Specialists to take part in agenda setting. This was perceived by some Specialists to sometimes lead to presentations and content that was not relevant to their immediate needs. Also missing in the minds of some Specialists was the time to work in content groups to address math-or science-specific questions. Specialists were also critical of the time spent on housekeeping tasks and frustrated with paperwork requirements.

The Training of Teachers, 2003-04

The following two sections address training for teachers. The first section presents data from the summer training of First Wave teachers in 2003. The content of the training across the different OMS-supported curriculum are described and analyzed and written reflections of participating teachers are summarized. Following this is a section on school-year professional development for teachers.

Summer Training for First Wave Teachers, 2003

OMS required First Wave teachers to attend professional development sessions during the summer of 2003 on the CMSI curricula chosen for their school. For example, if an Intensive Support school chose Everyday Math and Connected Math as its curricula, the primary level First Wave teachers attended Everyday Math professional development and the middle grades teachers attended Connected Math professional development.

OMS contracted the publishers and/or the authors of each of these chosen curricula to teach the professional development sessions for all First Wave Teachers. In addition, other CPS teachers using these curricula were able to take these workshops free of charge if space was available. The dates, length, and format of the curriculum workshops varied. Table C-4 offers a basic description of the form of these workshops.

Table C-4: Characteristics of Curriculum-Specific CMSI PD Workshops, Summer 2003

	Dates Offered for CMSI Teachers	Total Hours	Location	Estimated Number of Teachers Attending
Connected Math	August 11 - 14	24	TAMS	80
Everyday Math	August 13 - 15; August 20 - 22	18	Ray School	430
Math Thematics	August 19 - 22	24	TAMS	130
Math Trailblazers	August 18 - 21	24	Museum Science & Industry	140
Science Curricula	August 11 - 15	30	Loyola U	250

Observations of the curriculum workshops by evaluators revealed variation in the approach of the presenters and a resulting unevenness in the level of involvement of participants and their corresponding level of engagement.

Table C-5 provides descriptions of a sample of teacher professional development sessions offered by providers of elementary curricula supported by CMSI. In each description, we focus on how time was spent and how teachers were actively engaged in learning about the curricula. In terms of time usage we look at when teachers used curriculum materials (books, teacher guides, manipulatives, exams) and when they reflected on the curricula, pedagogy and student learning. The data used to create these descriptions was collected in August 2003 during the Connected Math, Everyday Math, Math Thematics, Math Trailblazers and Science Curricula workshops. Each of these workshops took place over a 3- to 5-day period. We observed at least two sessions of each of these workshops. For each curriculum workshop, we describe one of the early sessions and then one of the late sessions.

Table C-5: Description of CMSI Curriculum-Specific PD Workshops, Summer 2003

	Sample early session	Sample late session	Active participation
A	Participants were given about 40 minutes to look at a particular strand in the book to see the strand's big ideas. There was also some limited time for participants to reflect on how to modify the curriculum for their own use. About 3 games were presented (only a handful of the teachers participated) and 1 complete lesson was quickly presented with minimal discussion on the characteristics of the curriculum's lesson format.	The entire day was spent using materials and to some extent reflecting on how this might work with one's students. The first 2 lessons in the morning ran about 45 minutes each with brief (5 minute) discussion. The third lesson of this day took 10 minutes with 15 minutes discussion. The fourth lesson took 15 minutes to read and discuss. The remainder of the day included 10 minutes on modified assessment, 10 minutes on another lesson, 35 minutes on another lesson, a 10-minute game, 5 minutes on another lesson, and 15 minutes for announcement/paperwork.	Active participation was hindered at times when the presenter did not allow time for participants to respond and hurried them on by telling them what they should have learned. Participants watched presenters who did some modeling of lessons; instructors asked participants what they might do to modify lessons for their students and then participants asked if modification was allowed. Presenters were unable to get all participants to be engaged in the presentation and unable to stop the disengaged who were talking loudly to each other in a manner that distracted others throughout the days.
B	Presenter took 25 minutes to go over sample teacher guide section-by-section. This took place before spending approximately 1 hour doing an actual lesson. Reflection took place	Participants were engaged in multiple activities taken one at a time and followed by a brief discussion that ensured they understood the activity. For example, teachers were given a minute	Active participation was facilitated because participants were given time to experiment and process as a lesson unfolded. It also helped that participants actually performed

	only to the extent participants would naturally do this while involved in the lesson/investigation presented. The rest of the day was spent on an overview presentation and explanation of curriculum.	to review their work of the previous day where they worked with specific equipment/supplies. The next minute they were asked to retrieve their supplies. This process took about 3 minutes. Then they had a one minute discussion of why this was easy. This process was repeated again. This style of presentation was repeated over and over again for the length of the session: Do a 5 minute activity and discuss for 5 minutes…etc. The total time spent doing activities and discussing was about 2 hours with another 25 minutes for Specialists and Facilitators to meet with teachers.	the experiment or engaged in scheduled conversations/planning with school team/Specialist/Facilitator. The timing was about right with participants engaged in hands-on work and having enough time to talk/reflect on it (not too much time to get off track and not too fast to move without all following along).
C	The day included time for working with materials (texts, assessments, other facets of curriculum) organized in centers. After a brief introduction to the centers, 1 hour and 40 minutes was spent with participants working at centers (with about 12 minutes at each) and then debriefing for 25 minutes. In the afternoon another 55 minutes was spent engaging with 6 games organized in centers.	Participants spent one hour viewing materials at another 6 centers which featured different lessons from different units. Another couple hours spent on gathering, organizing, and providing materials from earlier sessions to take back and use in their own classrooms.	There was some hindering of participation by some teachers who were not "sold" on the curriculum and who then discussed this with presenters. However, there was a lot of active participation facilitated by the work in small groups at the centers. The center activities gave participants a chance to try out multiple activities, and also gave school teams time to talk about how their curriculum could be implemented in their particular school. By getting a sense of what the various units looked like, teachers got a sense of the progression of curriculum and the difficulty of lessons. Also teachers were able to see how students would learn a topic in depth over the course of time.
D	Participants worked with materials during an 8-minute activity with discussion. They spent 20-25 minutes navigating texts for components of a lesson, 13-minute in-depth group work activity (followed by a 4-minute discussion and assessment), and 30 minutes doing an activity (followed by a half hour for written reflection). In addition there were presentations of 30 minutes for introduction and logistics, 15 minutes for introduction to grade level and curriculum/resources, one hour for an explanation of 4 major activities with reference to teacher's edition and student text, and an hour for explaining (not trying out) 4-5 games.	Participants spent time doing activities and games and observing videotaped lessons and then discussing them (6 different ones ranging from 6 to 20 minutes each). Then they spent an hour on various parts of assessment (purpose, how to know what students know, performance assessment, and curricular components of assessment). They also spent one hour on one unit and watched a video clip on this.	Various hands on activities facilitated engagement. Some opportunity to engage participants was lost when games and activities were directly explained to the participants, rather then allowing teachers to engage in them for themselves.
E	Most of the session involved listening to presenters. Part of the time the presentation was about what was in the curriculum, but it was not hands on time to use it—other than to physically place some handouts in a resource binder. There were a couple instances of activities; however, they were not focused on use of materials, but, instead, as the presenter said, these activities were used to model classroom management and cooperative learning. In one, teachers paired off and interviewed each other. Then they introduced each other to the full grade level group. In a second, they paired off and sat back to back. Next they described to each other an object that the other had to draw without asking questions. Reflection was not part of the session other than when teachers wrote down question for presenters to	Small groups worked in grade-specific sessions. Groups engaged as learners in 3 activities and in doing so may have reflected on the curriculum, pedagogy and student learning. The discussion/debriefing time after the activities was for the whole group and about 5 to 10 minutes long with the presenter primarily giving advice to teachers after they reported on what they did in the activity. In a previous day, teachers had summarized lessons from the first unit and on this day shared these copies with others. About 45 minutes was spent on this including a discussion of curriculum specific materials to use with lessons. For example, 10 minutes of this discussion was on how to fill in a lesson plan sheet. During the next 2 hours, teachers spent about 10 minutes drawing concept maps and 10 minutes doing a game.	Active participation was hindered by the non-engaging use of PowerPoint in the presentation. Further active participation was stifled by a presenter who constantly "gave advice" to participants. Still, some small group exercises and grade specific discussions facilitated active conversation.

	answer later.		

Teachers who participated in the workshops were asked to provide written reflections at the beginning and end of their professional development experience.[4] At the beginning of the workshops, teachers across the five curriculum workshops hoped to gain knowledge specific to the implementation of the curricula as well as general knowledge on math/science content and the use of standards-based materials. "I hope to learn about the math program and its elements and to be able to effectively use it in my classroom," one teacher wrote. "I hope to improve and increase my math content knowledge," wrote another. Teachers also hoped for enhanced knowledge about assessment, pacing, and classroom management. Other teachers stressed relational goals for the workshop, hoping to establish strong working relationships with Specialists and Facilitators and to take advantage of the opportunity to talk with peers about teaching. "I would like to see this workshop as a discussion based among teachers," one teacher wrote. Other teachers had hopes around learning new ways to assist students with special needs. Teachers hoped to learn the connections between the curriculum, State Goals, and Board of Education requirements. Several teachers wrote, frankly, that they hoped to gain CPDU credit.

Across the five curriculum workshops, teachers concerns going into the trainings were vast. These concerns included questions about the curricular materials, questions about whether these materials would address students' basic skills needs, concerns about the coordination and duplication of materials, and concerns about the level of support for the Initiative by teachers, OMS, and CPS. Teachers were particularly concerned about having the time they needed to implement the new curricula and the pacing required to get through the materials in the course of a year. For several of the curricula, teachers were concerned about spiraling. Would this approach be effective for all students and would it produce positive results in standardized tests? Materials management was another key concern. "Will I be able to manage all of the components of this program in my classroom?" wrote one teacher. Teachers also asked difficult questions about whether there would be consistent implementation in their school--Would all teachers buy-in? Teachers didn't just ask the hard questions of themselves and their teacher colleagues but extended the concern about buy-in to their administrators and CPS leaders. Would principals understand the curriculum and the expectations of the Initiative? Would CPS really commit to the CMSI? "My main concern is whether or not this program is something that CPS is really invested in. I have seen too many 'fly by night'--'here today, gone tomorrow' programs."

At the beginning of the workshops, teachers foresaw the need for ongoing training during the school year, access to curricula materials, and feedback from the Specialist. "I want solid training," one teacher wrote, "I would appreciate a few meetings throughout the year to discuss progress and troubleshoot problems." Teachers suggested that perhaps there could be centralized locations for curriculum materials or a sharing program between schools. They also thought that ongoing feedback would be crucial in their work. "I need to know how am I doing and what do I need to change?" one teacher wrote. Teachers wrote about this need for feedback in relationship to the role of the Specialist in their school, wondering if the Specialist would have the time and skills to assist and support them.

At the end of workshop sessions, teachers again gave written reflections.[5] Teachers described what they gained and what concerns remained. They also gave specific examples of positive experiences in the sessions and suggestions for improvements.

---

[4] Prior to the workshop starting, teachers were asked the following three questions: (a) What do you hope to gain from this workshop? What do you expect this workshop can provide you in terms of the tools/skills you need to perform your job? (b) What are your main concerns as you start your working in the Chicago Math Science Initiative (CMSI)? (c) What questions do you want answered about your work in the CMSI? What kinds of support would you like to receive? 403 teachers responded on these initial written reflections.

[5] Teachers were asked again to reflect in writing at the end of the workshops. They were asked: (a) What skills/tools/insights did this workshop provide you with to assist you in your work within your school? (b) What are your main concerns as you begin implementing the CMSI in your schools? (c) What was the most important thing that happened during this course/workshop? Please explain why and what connection this might have to your classroom, school and the broader scheme of CMSI? (d) What would have made this workshop more beneficial/useful? (e) Through the course of this workshop, how has your relationship with fellow teachers changed or developed? (f) Through the course of this workshop, how has your relationship with your School Specialist, your Area Math/Science Coaches and the Office of Math and Science staff changed or developed? Please describe.

Teachers reported that they gained

- Knowledge on how to use materials
- Knowledge on the philosophy of the curriculum
- A better understanding of materials through student activities and the use of manipulatives
- A higher level of buy-in to the programs
- An appreciation for consultants/teachers who gave practical implementation advice
- A better handle on pacing
- A better understanding of assessment tools
- Improved content knowledge

Teachers main concerns as they left the workshops were related to

- Time/pacing
- Materials management
- Standardized testing
- Lack of correlation between curriculum and State Goals
- Adjustment of children in upper grades to curriculum approach
- Lack of basic skills in materials
- Own content knowledge
- Support of teachers, principals, parents and CPS

The most important things that happened during the workshops were

- Learning new methods of teaching
- Working with fellow grade level teachers
- Increasing one's confidence
- Understanding the standards-based approach
- Having time to create own materials

Suggestions for improvements in workshop included

- Workshop-format—Rotating schedule with choices on content
- Workshop-format—Needed longer session
- Workshop-timing—Earlier in summer
- Wanted to view "real lessons" on video or by presenters
- Wanted more help with pacing
- Wanted more practical ideas for implementation
- Wanted presentations tailored to participant questions
- Earlier access to materials

In addition, teachers were asked to reflect on the relationships they built during their involvement in the summer CMSI workshops. Teachers shared the following observations about their relationships with other stakeholders in the Initiative.

- Learned strategies from fellow teachers
- Learned from group work with other teachers what it is like for students to work in groups
- Gained opportunities to "network" with others
- Realized others share similar concerns
- Regarding the roles of their Specialist and OMS Facilitator– some better understood the role while others continued to express confusion about this role

The Science curriculum training was seen as very positive by Specialists, principals and the teachers. One science Specialist stated, "They all, all but one, were at the training in August at Loyola. They were all very enthusiastic. They are, as I said, learning as they go. So the training that they got there laid the foundation."

The principal from that school also praised the summer training at Loyola, saying, "Going to the different laboratories and doing the hands-on experiments, it was like a dream come true for [the Specialist] and myself because we always wished that this would happen at [our school]."

Another science teacher explained how the summer science training built a foundation for the expectations and plans for implementation. "For me, I'm a little bit more excited to be teaching stuff that I was presented in the summertime. Having that awareness in the summer and then being able to take that into the classroom and get the children's reactions. So that's been really fun for me."

And, science teachers, like math teachers, were positive about the opportunities to network: "What I like most is the interaction among the teachers from other schools…"

While science teachers had overwhelmingly positive thoughts on the summer training in 2003, they were especially critical of the brevity of the workshop. Most simply did not think it was long or deep enough and did not focus enough on classroom management issues. "This science approach is entirely different from what we did in the past," stated one teacher. "I thought they would provide longer, deeper training to prepare us." "I feel like I have an idea of what the materials are but no idea how to actually make it happen in my classroom, like how to manage the materials," stated another teacher.

School Year Training for Teachers, 2003-04

Our data on the training of First Wave teachers comes from a study undertaken on one particular math curriculum.[6] Structured observations of workshops considered the quality of the sessions and tracked the amount of time allotted to different types of instruction. The matched pairing of workshops session observations allowed for comparisons of university personnel-led workshops and those of newly hired consultants, making it possible to analyze the effects of scale-up of workshop sessions and to compare the populations of teachers participating. Finally, exit interviews of teachers provided insights into the impact of the training on classroom practice.

The collection of data on math professional development took place around the following framework:

Table C-6: Teacher Professional Development Evaluation Framework

Guiding Question	Design of Evaluation	Amount of Data Collected
1. Workshops	Observations were made using a protocol that framed desired qualities of professional development.	At total of 1218 minutes (~20 hours) from 4 workshop sessions across 2 grades were observed.
2. Consultants	Observations of workshops were sampled so to compare the same session in the same grade level with one led by experienced personnel (Intensive Support Schools session) and one led by a newly hired consultant (Non-Intensive Support school session).	Given the sessions sampled for observation, comparisons can be made between a pair of instructors in grades K-2 workshops and a pair in grades 3-5 workshops.
3. Impact in School	Teachers were asked how the workshops they attended influence their classroom teaching.	19 teachers attending workshops were interviewed; ten from Intensive Support school sessions and 9 from Non-Intensive Support school sessions. (This was typically 5 teachers from among the 8-30

[6] The data in this section is taken from a data brief written for Everyday Math in the spring of 2004. The data collection was done on a IHBE NCLB grant used to evaluate the Chicago Teachers Project.

		teachers attending each session).

Data was collected during matched pairs of workshops at two grade levels. These sessions were observed by an evaluation team member using a structured observation protocol, allowing for a detailed analysis of the format and content of the sessions. As they were leaving the sessions, we asked teachers willing to participate for their impressions of the training they have received and the impact of training on their practice. Of the ten Intensive Support (IS) school teachers interviewed, about half (N=4) had attended all but one of the sessions across the year (this number was different since some teachers interviewed were in cycle four while others were in cycle five). Three had attended all but two sessions and one attended only this session. Of the nine non-Intensive Support school teachers interviewed, 4 had attended more than one session while for 5 it was their first.

The matched pairs of these structured observation write-ups were then compared to understand the similarities and differences between workshops offered by university personnel and those led by hired consultants.

Here, we focus just on guiding question 2, as an issue that is relevant to all who are planning and providing professional development for teachers. How does the scaling up of the number of workshop sessions offered to accommodate increasing numbers of teachers affect the quality of professional development?

Instructors: University Personnel and Consultants

One of the original goals of the evaluation data collection on the math curriculum evaluation was to provide a comparison between the university instructors and the hired consultants serving as instructors of the teacher professional development. The data collection was designed around this purpose: observations of matched pairs of grade-level workshops, allowing for the comparison of the presentation of the same material by two different presenters.

This task turned out to be much more complicated than imagined when the evaluation framework was designed due to a factor the evaluation team did not anticipate—differences in the populations of teachers participating in the two sessions.

The teachers participating in the two non-Intensive Support school sessions (led by consultants) were generally less enthusiastic implementers of the curriculum, still questioning the spiraling approach and openly questioning the value of the curriculum. One teacher, upon entering the workshop 25 minutes late, announced that she was not using the math curriculum by choice but only because the principal forced her. She was convinced that the curriculum would not raise test scores. Another teacher in the session noted that she frequently skipped sections of the curriculum because she did not understand them or want to take the time to prepare for such "complicated and crazy" lessons. At the workshop session previewing the math curriculum units 10, 11, and 12, one participant reported being in unit seven, two were in six, and the others were using pieces of the program and skipping around (Consultant-led grades 3-5 early March).

The participants in the non-Intensive Support school early grades session, though generally less resistant to the math curriculum approach, still were very likely to report that they were not using the curriculum regularly, or that the school schedule was not conducive to proper implementation (Consultant-led grades K-2 session, late May).

Given this complication, it was difficult to separate these differences in teacher population from the presentation and teaching style of the instructor. Stark contrasts did exist between the sessions taught by consultants and those taught by University personnel. However, because the populations being served were different, it is understandable that instructors made different decisions in how to teach--tailoring approaches and goals based on who was sitting in front of them. The contrasts between the work of consultants and university personnel instructors teaching these workshops are presented in this section with the caveat that the reader should keep the difference in populations taught in mind.

Instructor-centered presentation and teacher participation

The first notable difference in the presentations of university personnel and consultants is in the number of minutes spent in instructor-centered presentation. University personnel, in the two observed sessions spent only ten and twenty minutes respectively presenting material, just 3 to 7% of the total session. The presenters were exceptional at doing very minimal amounts of talking. They briefly introduced the activities and then

allowed participants to engage in activities. The presenters were there primarily as facilitators. For example, the excerpt below from the observation notes of a grades 3-5 session exemplifies this.

> The university personnel instructor introduces the math message and asks teacher participants to describe one way their implementation of the curriculum has improved since the beginning of the year and one success they experienced. Teachers write on it. The teachers then discuss this in small table groups. The instructors then ask the teachers to share their experiences with the larger group. Eight teachers respond as follows:
>
> --**Teacher 1:** My pacing has improved.
> --**Teacher 2:** The lack of mastery made me nervous at first, but I am becoming more comfortable.
> --**Teacher 3:** There are kids who last year would have said 'math is hard and I don't like it' who now enjoy it. Their enthusiasm is there and that has made me more enthusiastic. There are much more comfortable with Algebra then they were and they are not afraid of that word.
> --**Teacher 4:** I am still struggling a bit with parts of the content, but each unit is getting easier.
> --**Teacher 5:** In the past, if the kids couldn't get it right away, we just didn't cover it. I think we are challenging them more than we were before.
> --**Teacher 6:** The kids were shocked at how much easier the ISAT was this year because of [the math curriculum]. Even the extended response.
> --**Teacher 7:** I am getting better at staying more than one step ahead of the kids. I am more prepared and confident and that is making the kids more confident.
> --**Teacher 8**: I started out afraid and then I just had the books so I used them and all of the sudden it started working. And I have transitional bilingual students and I didn't know if it would work, but I have been able to teach stuff through the games that I hadn't been able to teach them the previous years. Like the percentage circle. I never got to that before, I forgot about it. The names of triangles. The transitional bilingual students were able to learn that!

The extent of participation in small table group and full group activities varied between university personnel-led/Intensive Support school and consultant-led/non-Intensive Support school sessions. The two university personnel-led sessions had, in general, more teachers participating in conversations at the full group level. Consultants in the non-Intensive Support school sessions asked very good questions, attempting to engage participants in full-group discussions about their experiences or debriefing an activity. In many cases, no one would volunteer an answer, leading the instructor to fill in answers. An excerpt from a consultant-led/non-Intensive Support school grades K-2 session observation notes exemplifies this:

> The consultant instructor introduces number stories. Teachers then work on creating their own number stories. The instructor talks two individuals into presenting their stories to the group. The instructor then attempts to engage the whole group of teachers in discussion:
>
> The instructor asks: "What level are your children at in your room at this time in the year?" "Could they do work like this now, at stage 3 or 4?"
> None of the teachers respond.
>
> The instructor then asks: "What are the positives and negatives to thinking about numbers in this way, in the form of a story?
> No one responds.
>
> Again, the instructor queries: "What materials can you use in your room to connect these stories to ways of thinking that accesses the knowledge of different kids?"
> No one responds.
>
> Finally the instructor comments: "If something comes up in your thinking on this, let me know." The instructor then moves on and provides her answers to the questions asked above.

The difference in the response of participants is evident in the two excerpts above. However, it is difficult to untangle the extent to which the difference in response is due to participant characteristics or instructor actions. Five factors seemed to contribute to the differences in the amount of instructor "talk" and the level of

teacher participation in discourse. In the sessions led by consultants and attended by teachers not in CMSI Intensive Support schools the following five factors related to lower levels of participation compared to that in the university personnel-led sessions.

1. Teachers made less regular use of math curriculum and thus had less knowledge of the materials.
2. Teachers had lower attendance rates and the group attending a given session was not consistent across the year because some schools sent a variety of teachers to the workshop rather than the same teacher to the full set of sessions.
3. The teachers were more likely to struggle with the curriculum approach to mathematical content.
4. The consultants had less experience in facilitating dialogue with reluctant participants–in "pulling responses" from the teachers attending.
5. The Intensive Support sessions were staffed by two university personnel while the non-IS sessions were staffed by one consultant. Having two presenters in the room allowed them to support one another in a way that was productive for the session. For example, one university presenter could engage in a conversation with a teacher who was having difficulty while the other could move the session forward. And, the two could circulate while teachers were doing individual and small group activities, asking reflection questions and deepening the conversations and thinking of participants. Having two expert presenters in the room made the work easier and deeper.

It should be noted that the consultants who led non-IS sessions were extremely creative and resilient in dealing with the lack of responsiveness of their participants. One instructor talked to small groups and individuals during activities and then if no one responded to reflection questions in group discussions, she would note that, for example, "Sue had a very interesting comment during the work time that is applicable to this question." Then the consultant would ask Sue to share her thoughts. Another consultant, when no one responded to her reflection questions, kept encouraging teachers to "bring your thoughts on this or anything else up at any time." She did this every time she sought participation before offering her own thoughts and moving to the next topic. The consultants' expression of their enthusiasm for Everyday Math was not diminished by a lack of response from teachers and they were positive, focused and energetic throughout the workshops.

Coverage of material

The second notable difference between the university personnel-led and consultant-led sessions was in the approach to and depth of the coverage of the same materials. For example, in the grades 3-5 sessions, instructors worked through a set of activities using a pan balance in unit 10. The activity involved teachers previewing the lesson, and then working through a set of balance problems, using the pan-balance and then completing a worksheet. The consultant instructor ran the session by introducing the activity. The consultant demonstrated the use of the pan balance, but was unable to make it balance correctly. She abandoned it and moved quickly into the worksheet. The teachers were given some time to work through the balance problems and then the instructor walked through each problem on the overhead, asking participants to provide their answers and talk about how they solved the problem. The instructor asked if others had different ways to solve each problem, stressing that children would have diverse approaches (Consultant-led grades 3-5 early March session).

The university personnel-led session was framed slightly differently. The instructors explained that the participants would be previewing the content from the unit. They stressed that they understood that this was the first year of implementation for the participants and that many of them might not get to unit ten by the end of the year. They encouraged teachers to have the goal of getting to unit ten next year. The instructor told the teachers, "We know you are doing the best you can and we appreciate that but we can also push it a little next year knowing what you know now."

The university instructors next asked participants to read over the unit preview and to write down the big topics or goals that would be covered and what challenges they might anticipate in introducing the lesson. After the teachers had a chance to write about the unit preview and share in small groups, they then talked about their preview in the larger group. In the process, the instructors noted that the pan balance sometimes was difficult to use. "These are not exact measurements; this is something you can stress with your kids. They are 'about' measurements," one instructor noted. "They can be difficult to use but boy is it worthwhile to play with them to get it right because the learning is just so wonderful," noted the other instructor. The participants worked through the pan balance worksheet in table groups. The instructors then led them through a discussion

of each in turn. For each, teachers presented their answer. The instructors would then ask a follow-up question: "How is this algebra?" "What tools can you use to help your students solve this problem?" "What can you do for students who struggle with this?"

The difference in the approach to and depth of the presentation of materials seemed to stem from four major factors:

1. The teachers from non-Intensive Support schools in the consultant-led sessions did not engage readily in the dialogue in the same way their counterparts from Intensive Support schools did in sessions led by university personnel. Therefore, the instruction was more centered on the consultant in their sessions.

2. The university personnel framed the dialogue in their sessions in a few critical ways that favorably shaped the experiences of teachers in their sessions. The consultants leading sessions did not frame their sessions as strongly in these ways. This framing included:
    - A structured preview of the lesson that was to be explored in the session. This resulted in richer discussions and deeper understandings of the purpose of the session.
    - An up front acknowledgement of the difficulties to expect during the lesson, especially in using some equipment. The university personnel explained that the pan-balance was a difficult tool and when the teachers worked with it, showed enthusiasm for the outcomes even if imperfect. In contrast, the consultants did not talk about this at the start of the lesson and teachers in their group who were skeptical about the math curriculum to begin with found the imperfection of the tool one more reason to discount the curriculum.
    - Noting that not all of the teachers attending would be teaching the lesson reviewed that day. The university instructors were empathetic and understanding of the fact that first-year implementers were unlikely to reach unit 10. They stated this up front but suggested the activity was still valuable.
3. Although it is true that the consultant instructors could have framed the content to be reviewed differently, teachers from non-Intensive Support schools sessions were even further behind in the pacing than the Intensive Support teachers. Previewing unit 10 may not have been an appropriate activity for them.
4. There were fewer ongoing reflection questions in the sessions with non-Intensive Support teachers. These questions kept the session moving and deepened the inquiry in the Intensive Support sessions. It is likely that the lack of the use of such questions was a combination of both the lack of participant responsiveness in non-Intensive Support sessions and a lack of experience of consultants in this practice.

<u>Teacher Professional Development Considered</u>

The teacher professional development offered in the summer of 2003 had both positive and negative aspects. Generally, teachers seemed satisfied and excited with their experiences at the curricula workshops. Teachers felt they gained both general content knowledge as well as a better handle on the content, pacing and philosophy of the specific curriculum they were to implement. Some teachers reported having a higher level of buy-in to the program and an appreciation for the consultants and teachers who led workshops.

That being said, teachers left the curriculum workshops with many of the concerns they came in with. Teachers were concerned about having the time and getting the pace right to implement the curriculum well. In addition, teachers' perceived these curricula material as lacking the basic skills focus needed in their schools. Moreover, they were exasperated when thinking of how they would manage all the materials included in these curricula. Teachers also had concerns for their students making the adjustment to the new curricular approach. Would students not exposed to the curriculum at the lower grades be able to make the transition to the new approach? Would low achieving students do well in it? Equally disconcerting, teachers worried about the level of support the initiative would receive from their fellow teachers, the school administration, parents and the CPS.

At the same time, teachers appreciated the opportunity to work with fellow teachers, to gain new understandings and to increase their confidence in both math/science content and the new curriculum. Teachers suggested that the workshop structure could be improved by providing more choice in the topics they would learn about, by changing the length of the workshop and by better tailoring the workshop sessions to their unique situation.

There was nearly universal appreciation for the opportunity to work closely with other teachers, providing workshop participants with new connections, networking opportunities and ideas. Relationships with Specialists, Coaches, and OMS Facilitators were less frequent. Teachers were concerned about how and if Specialists would be able to support implementation at their schools; they wondered if Specialists would have the skills or be allowed the time needed to support teachers in deep and meaningful ways. Because Specialists, Coaches, and Facilitators were not required to attend curriculum workshops (certainly, they also could not be at all of the workshops since several took place at the same time) there was less opportunity for teachers to develop working relationships with these people.

Although data on school year teacher professional development is limited, analysis points to some important considerations and the need for further inquiry. Based on our structured observations, there was evidence that the instructors shaped sessions using tenets of high quality professional development. Teachers attending sessions reflected, applied ideas, were active participants, discussed challenging ideas, and were engaged as experts to a large extent.

The workshops were set up to work well with teachers who attended *throughout* the school year. Schools need to be sending the same participants to the workshop across the year in order to gain the full value. Still, even with more consistent attendance, there may be good reason to reassess the format and goals for the sessions for the teachers in the non-Intensive Support schools. These teachers appear to be using the materials less frequently and have less school-based support for teaching using new standards-based approaches. The findings here suggest the need to assess the needs of different teacher populations receiving OMS professional development. Those in Intensive Support schools may have different needs from 2003-04 Readiness schools or a school on Probation. And teachers within the same school may have varying levels of knowledge and expertise. How can these needs be assessed and addressed?

Data considered, while pointing to some possible differences in teacher population needs in professional development also revealed some possible ways in which newly hired trainers in teacher curriculum PD can be assisted in improving their training skills:

- Working with consultants on how to frame a lesson so to set the stage according to the needs of a given group of participants.
- Working with consultants on the use of reflection questions throughout the introduction of materials to promote greater teacher participation.

OMS Principal Meetings

The Office of Mathematics and Science organized a series of meetings for Intensive Support school principals to meet together and discuss the CMSI implementation. Six of seven meetings to date were observed by external evaluators. Each meeting ran from 11 am through 2 pm. The first half hour was used for lunch and time for principals to network together. There was also a 10 minute break. The amount of time used for general questions, discussion of next steps, and evaluation ranged from 45 minutes at the first meeting to 15 minutes at the two most recent meetings. This time was used to inform principals on a variety of topics and engage them in discussion about how to implement the new curricula and policies in their schools (from 95 to 125 minutes). The meeting schedule and the topics covered across the sessions are summarized below in Table C-8:

Table C-8: Description of OMS Meetings for CMSI Intensive Support Principal

	Date	Math and/or Science Intensive Support School Principals	Observed by External Evaluators?	Topics Covered
1	October 28, 2003	Math	yes	Video / discussion of classroom instruction
	October 30, 2003	Science	no	Developing an implementation strategy
2	December 4, 2003	Math	yes	Developing an implementation strategy
	December 11, 2003	Science	yes	Small group discussions on curricula, standardized tests, classroom assessments
3	February 4, 2004	Math	yes	Panel presentation on school implementation
	February 5, 2004	Science	yes	Implementation and the SIPAAA
4	April 5, 2004	Math and Science	yes	Next year's budget and implementation Small group discussions on curricula, scheduling, materials
5	May 4, 2004	Math		
	May 5, 2004	Science		

At each meeting, a folder of materials was given to each principal. For example, at the first meeting the folder included handouts of the commitment their school had made, directories of OMS staff and all of the Intensive Support schools, an article about curriculum implementation, and a description of the Specialist's job—"A job with many hats!" At the April meeting, they received official information about the changes in the CMSI budget for 2004-05 and how this impacted their schools.

A common theme across these meetings was Marty Gartzman's message to principals that they need to trust the new curricula and that they, as principals, had an important role in convincing their teachers to use the curricula as intended. As he explained at the first meetings, in the past "good teachers" were typically those who were creative and supplemented the curriculum—who did not just "teach to the text." However, in these cases this was because the curricular materials needed to be supplemented—they contained "big holes." The new CMSI curricula were carefully designed and each tells a coherent story. Supplementing or leaving parts of the lessons out interfere with the story. His message to the principals was that these curricula had proven track records, and principals/teachers needed to "trust the materials" and "stay the course" (*Observation, 10/28/03*). In the second round of meetings, Gartzman explained that students using the CMSI curricula do better on tests and that principals need to encourage teachers that taking time away from these curricula to use test prep booklets is counterproductive (*Observation, 12/4/03*). In the April meeting, though the principals were preoccupied with planning for 2004-05, Gartzman made a strong point at the end of the meeting that with 20% of the school year remaining, principals needed to continue to encourage their teachers to "make every minute count" and to remind teachers that the CMSI curricula are aligned with the ITBS, and that teachers need to stay the course implementing the curricula as intended (*Observation, 4/5/04*).

Role

The role of the principal in the CMSI implementation was central to the principal meetings. As noted above, one message from OMS to principals was that they have a key role in convincing their teachers to implement curricula as intended without supplementing materials. In addition, other facets of their roles were discussed. At the first meetings, Peter Martinez of the UIC Center for School Leadership led discussions around a handout titled "An introductory list of the things that principals need to take personal responsibility for in order to make the Initiative successful in their school." In brief, this list included the following:

1. Meet weekly with Specialist
2. Regularly visit implementing teachers
3. Make sure teachers are using imbedded assessments and examining student work
4. Ensure Specialist and teachers, attend required CMSI meetings
5. Communicate about CMSI activities with LSC
6. Communicate about CMSI activities with all teachers
7. Display student work from CMSI classrooms

8. Make work of CMSI public (*Observation 10/28/03*).

At the second round of meetings Martinez had small groups consider four key elements for success that principals play a role in:

1. Ensuring required amount of time per day/ per week for science and math
2. Ensuring all First Wave teachers use CMSI curricular material
3. Constructing the school schedule to allow teacher collaboration
4. Communicating the importance of CMSI to staff, parents, students, LSC, community (*Observations 12/4/03, 12/11/03*).

At the third set of meetings, principals joined a panel to talk about their implementation experiences. The principals on the science panel described how they did some of the following things: struggle to find common meeting times for First Wave teachers, have Specialist present to parents, secure money for "sub buckets" so teachers can observe each other teaching new curriculum, meet weekly with Specialist, find funding so teachers are paid to meet after school, support Second Wave teachers attendance in curriculum professional development (*Observation, 2/5/04*).

At the April meeting, the principals' role in securing resources for the CMSI implementation was at the forefront. In light of new budgets and probation policies for 2004-05, principals discuss how they might find additional funds to support their specialists and the cost of curricular materials. They talked about the need to work with their LSC on the SIPAAA and budget. They talked about how to logistically deal with the ordering of curricular materials and the transfer of budget funds from OMS to the schools.

Considering CMSI Principal Training

Observations of principal meetings reveal high quality training devoted to topics that were relevant and useful to CMSI principals. Three barriers existed to the success of the training, according to interviewed OMS staff. In the first place, staff suggested that the training was good about telling what the principal role was to consist of, but not the "how to do it." "We were very good about defining the role of the CMSI principal, but not about giving them the tools, like observation forms or checklists, to help them to do it," stated one OMS staff member. "We did well with the ideas, but it was too theoretical," stated another. OMS staff felt that they did a much better job with having schools share their CMSI stories than helping the principal with his or her role. Secondly, OMS staff felt that the principal meetings could have been used to provide principals with curriculum training that would help them to understand the role of the Specialist, how to observe implementation and a better grasp of the CMSI. "Principals cannot have productive evaluations of their teachers in these materials unless they have used these materials," stated one OMS staff member. "Getting them to roll up their sleeves and use the materials would help them to evaluate teachers and give them a better appreciation of the need to protect the Specialist role." Lastly, OMS staff members suggested that low attendance at the principal meetings was an issue. "What we did was good for who was there, but many CMSI principals rarely or never came," stated one OMS staff member. "We should have had stronger accountability for attendance at those meetings," stated another.

Analysis of TAMS Readiness Training

Readiness teachers were assigned to take a series of professional development workshops that OMS arranged for the Teachers Academy for Mathematics and Science (TAMS) to teach. This training is considered through: 1. analysis of the *objectives* of the TAMS training taken from the syllabi from each grade area developed by TAMS staff; 2. consideration of the translation of TAMS objectives into the agendas developed for each session; 3. descriptions of a sample of Readiness sessions based on evaluation team *observations*; 4. a description of the strengths and weaknesses of Readiness training based on *teacher interviews*; and 5. an analysis of Readiness training in light of OMS leaders stated goals and objectives based on *OMS staff interviews*.

Training occurred in grade area groups: 1. Pre-K and K; 2. Primary (Grades 1-3); 4. Intermediate (Grades 4-6); and 5. Upper (Grades 7-8).

Analysis of TAMs syllabi developed at the beginning of the school year reveal that Readiness training objectives ranged across five general topic areas:

- Classroom organization and management. For example, in training session one in the Pre-K/K group, one objective for the day was to "explore how room arrangement affects and enriches math, science and technology" (TAMS Readiness Syllabus).
- Math and science content. For example, in training session two in the primary group, one objective was to "explore the properties of balance and motion" (TAMS Readiness Syllabus).
- Scientific/Mathematical process and analysis. For example, in training session four in the intermediate group, one objective was to "confer with colleagues about all aspects of an experiment" (TAMS Readiness Syllabus).
- Assessment. For example, in training session eight in the upper grade group, one objective was to "explore the portfolio as an assessment tool" (TAMS Readiness Syllabus).
- Understanding standards based curriculum/comparing CMSI curricula. For example, in training session eight in the upper grade group, one objective was to "gain familiarity with curriculum chosen by CMSI."

The emphasis on the content areas described above varied by grade level area. Coding the objectives for each session reveals the following:

Table C-9: A Summary of TAMS Readiness Training Topics

	Pre-K/K	Primary	Intermediate	Upper
Classroom Org/Management	4/26= 15%	0/43= 0%	1/41= 2%	2/43= 5%
Math/Science Content	15/26= 58%	33/43= 77%	22/41= 54%	19/43= 44%
Process and Analysis	6/26= 23%	10/43= 23%	15/41= 37%	11/43= 26%
Assessment	1/26= 4%	0/43= 0%	3/41= 7%	1/43= 2%
Standards-based/Comparing curricula	0/26= 0%	0/43= 0%	2/41= 5%	10/43= 23%

Considering the objectives in this manner reveals that the vast majority of the written objectives of TAMS Readiness training focused on the presentation of math and science content and introducing workshop participants to the process and analysis of math and science knowledge. A very limited number of objectives focused on the consideration of the standards-based approach in general and the active comparison of the CMSI endorsed curricula, although the upper grade objectives was at about 23%. Similarly, in classroom organization and management, the pre-kindergarten/kindergarten objectives were about 15% of workshop time while this was much more limited in the other three grades.

The vast majority of workshop time across all four grade areas was on introducing participants to new, standards-based approaches to math and science content with much more limited attention on classroom management, assessment, and the standards-based approach or comparing CMSI curricula.

Observations of TAMS Training

Observations of TAMS training by evaluators reveal a general commitment on the part of Readiness trainers to the use of hands-on activities and inquiry-based approaches to presenting materials. Observed sessions generally involved teachers working through a given mathematical or scientific concept drawing upon activities from CMSI-supported curricula. Teachers were encouraged to reflect on practice by sharing their experiences in implementing an activity from the previous TAMS training (Primary session Observation 12-3-03). Participants actively participated and applied new ideas, for example in learning centers, trying different instructional approaches to the same mathematical concept (Upper session Observation, 12-3-03). The activities had relevance to their work as math and science teachers, for example, as they gained insights on pendulums and the ways in which they could lead their students through the same discovery process they experienced (Intermediate session Observation, 1/4/04).

Observations also revealed some unevenness in training quality due to three factors: varied abilities of training staff; varied needs of participants; and varied prior knowledge of participants.

Researchers observing training sessions noted variation in the ability of TAMS trainers to connect with participants and for participants to understand the purpose of activities. For example, in a primary grade

session on 12/3/03, participants rotating through learning centers asked repeatedly "what is the purpose of this?" without feeling as though they were receiving answers from trainers. This point is described in more details in the words of participants in the following section.

Researchers also noted that the division of teachers into grade level groups (for example, grouping teachers in grades one through three together) meant that what was presented was perceived as more or less relevant to different participants.

And, finally, researchers suggested that the varied prior knowledge of participants left some overwhelmed and others bored. For example, in an Intermediate session on 1/4/04, participants were led through an activity where they were to differentiate between "qualitative" and "quantitative" variables. This promoted rich discussion among some participants while others, who were less clear about the distinction, were not on task.

Readiness Teachers Reflect on TAMS training

TAMS training was reported as having both strengths and weaknesses by Readiness School teachers in case study schools who participated.

Strengths

Teachers who participated in TAMS training gave some positive feedback on the sessions. Teachers at one case study Readiness School reported that the TAMS instructors were highly prepared and had given them good ideas. Several teachers stated that they had tried activities that they learned in training, and while it was a commitment of time to prepare for the lessons, especially finding and organizing the required manipulatives, there was nonetheless "a big payoff." One intermediate grade teacher in a case study school praised the TAMS sessions for their help with team-building. "They show how we can really work together." In general, staff at this Readiness School reported that they would like to have had more interaction with TAMS staff, especially in their own classrooms.

Teachers from a second case study Readiness school also thought that the sessions at TAMS were a crucial part of the development of understanding of the curriculum materials they were choosing between. These teachers especially enjoyed networking with teachers from other schools and gaining new teaching strategies from both other teachers and the trainers.

In our third case study Readiness school, teachers had mixed reviews of the benefit of participation in TAMS training. Teachers in this school were complimentary of the early childhood workshops, noting that they were developmentally appropriate. In science, teachers at this school noted that they gained new ideas. In assessment, they appreciated the introduction of alternative approaches, such as the portfolio system.

Weaknesses

While Readiness teachers were positive about the curriculum knowledge they received and the opportunity to interact with other teachers, they gave some indications that certain aspects of the TAMS training was less than positive.

At one Readiness school, criticisms were centered on two main themes. The first theme was that the sessions were too rushed. "We're kind of overloaded with information; we're cramming. The…presenter is trying to get everything in…it's like a cram thing." Another teacher stated, "We used to go to training, and I think there were 10 sessions a year, so it wasn't just rush, rush, rush."

The other recurring critique was that teachers felt that the TAMS sessions existed in an idealized world, not one relevant to their own school environments. An upper grade teacher at the school remarked that, "The only thing is, they use the laptops, and our technology here right now is rather limited, and with the plotting and the graphing... Ideally, it's wonderful, but we're not able to do it." Some teachers at this school suggested that the only way to make the training relevant to their school, their classrooms, was to have the experts conduct on-site training. One second grade teacher explained:

> Instead of saying, Ms. [Smith], how did that work in your class? They can say, I was in Ms. [Smith]'s class, she had 20 kids, and this is what I had to do. I had to alter this for her kids; she had one kid who just doesn't know that the sun rises and sets, and he just sits there staring into space, so what I had to do to get him involved in the lesson was this and that. Ok, and then, I went to Miss [Anderson]'s class and blah, blah, blah. Stop, you know. Get hands-on, if you tell us, get these kids hands-on, they need to be hands on with us…. Also, it's picture-perfect there, with all these materials… it's like, come on now, it's not realistic.

At another Readiness school, teachers reported that while the professional development workshops provided them with exposure to curriculum materials and leadership training, teachers expressed "disdain for many of the trainers." The teachers complained that the trainers often did not approach the sessions as if they were communicating with adults. They also thought the sessions were too long and somewhat repetitive. Teachers at this Readiness school also expressed the need for further support when they were transitioning into the new curriculum, worrying that the training on the curriculum before implementation may have been wasted time.

Teachers from a third Readiness school were very disappointed in the TAMS program. This school had a history of work with TAMS prior to CMSI and was disappointed that OMS hired TAMS for the Readiness training. These teachers noted that their work with TAMS previous to the CMSI was very disorganized. These teachers claimed that TAMS did not follow through on several promises including the delivery of promised materials, payment of teacher stipends, and visitations for classroom observations.

Teachers at this Readiness school felt that their previous negative experiences were again repeated with TAMS Readiness training. The teachers expressed having had experienced disorganization and confusion about the workshop time they were to attend and found the TAMS personnel to be difficult to work with. Teachers at the school had additional criticisms of training content and organization. They noted that training focused on content that was not new or challenging to them, and it was led by instructors who were not prepared, used time poorly, and offered sessions to groups that were too large. In addition, teachers were not convinced that participation in these workshops was preparing them to become an Intensive Support school in 2004-05. "I'm not getting any training in [the curricula we are to implement in 2004-05] from this program. I would not be able to walk away from this and be confident that I could teach it."

Considering TAMS Readiness Training

TAMS training for Readiness Schools was designed to "ready these schools to be Intensive Support schools in 2004." OMS staff described how participation in TAMS Readiness training and other development within the school staff would increase the collaboration, commitment and leadership necessary to become an Intensive Support school. This was intended to be developed through the content of the workshops which would expose participants to curriculum materials, preparing them to make a decision about which materials would best serve the needs of the school. Giving teachers the chance to work with materials would increase their commitment to and understanding of the standards-based approach. Commitment was also to be demonstrated through attendance at the workshop itself. Schools were to show their readiness for and commitment to the CMSI through their active participation in the vast majority of the training sessions.

Analysis of TAMS Readiness session syllabi reveal that the primary objectives of TAMS staff was to provide participants with an exposure to standards-based approaches to teaching a mathematical or scientific concept. Three factors limited the success of the training: 1. Participants' expectations of the purpose of the sessions; 2. The mixed needs of participants; and 3. The mixed quality of the TAMS trainers.

In the first place, participants' expectations for the session were different from the objectives of TAMS staff. Participants understood Readiness sessions as being designed to help them to choose between the OMS-supported curricula. Because TAMS objectives were primarily focused on exposing teachers to mathematical and scientific concepts, the sessions blended pieces of the curricula into the same sessions and sometimes did not reveal which sources the materials came from, not allowing participants to differentiate. In addition, schools were asked to provide indications of which curriculum they would like to choose early in Readiness training, before they had been exposed to the options. Because participant expectations for the content of the training were different from TAMS objectives, teachers felt frustrated, at times, with the training.

Secondly, as mentioned previously, the mixing of teachers of different grade levels into area groups made material more or less accessible to participants depending on their grade level. Similarly, participants were more or less comfortable with standards-based materials and the concepts presented in the workshops, meaning that for some participants the material was too easy while for others it was very difficult.

Readiness schools were identified by OMS staff through the application process as lacking in one area: commitment, leadership or coherence, to be designated as Intensive Support schools in the first round. This suggests that the participating Readiness teachers had different needs in training. Perhaps different training sessions could have been designed to meet those needs, rather then all being grouped together by grade area.

Finally, the mixed nature of the quality of trainers affected the success of the workshops. Teacher descriptions of feeling that people were "talking down to them" or that trainers were unwilling or unable to make connections between presented material and their school setting was a barrier to the participants focusing on the material of the workshop.

Curriculum Showcases

OMS planned two showcase days January 12 and 13, 2004 for Readiness schools to come together as school teams to explore the CMSI-supported curricula. These showcase days were well planned events taking place at the Museum of Science and Industry with representatives from all of the CMSI approved curricula present.

The days began at 8:00 with registration/breakfast followed by an 8:30 A.M. welcome session facilitated by OMS staff to explain the importance of the day in relation to the CMSI and Readiness Schools' movement to Intensive Support standing in the coming year. This was followed by 2 hour-long sessions, followed by an hour lunch break (lunch was not provided but a discount was available at the Museum cafeteria), and then 2 more hour-long sessions with the final session ending at 2:40—the normal end of school day for students. The time from 2:40-4:00 was set aside for school teams to meet and discuss the characteristics of the instructional materials presented during the showcase. In addition they were able to compare materials available at the vendors' booths and to ask OMS Facilitators questions regarding implementation of the materials.

Upon registering, each participant was given a folder which provided the schedule for the day's sessions, a welcome letter with the goals for the day, a map of the Museum, a flyer about the Family Math Leadership Workshop's fourth and last event coming up in a month, an article entitled "How children learn" from Science for All Children, A description of the CMSI (including rationale, basics, messages, and goals), an OMS Staff Directory, Math and Science Instructional Materials Vendor Directory, two evaluation forms (1) about the showcase itself (2) about the individual sessions, and a note of thanks to the various supporters of the event. A binder was also given out. This binder included all of the above information plus the following:

- Descriptions of the K-8 math instructional materials (a brief description, list of student, teacher, and other supporting materials, and a description of the impact data compiled to date)
- Descriptions of the K-8 science instructional materials (a brief description, content, format, instructional design, assessment, resources and support, other relevant information.)
- 2 instructional materials evaluation tools
    - Selection criteria from the Arlington Public Schools in Arlington MA (for math)
    - National Science Research Center Evaluation criteria for curriculum materials (science)
- A list of math and science resources (lists of books/articles of interest)
- A local resource directory
- TIMSS 1999 International Science Report
- 9 full length articles dealing with implementation, math/science, achievement, standards-based curricula.

Following the welcome session, the day was set up with 2 morning sessions and 2 afternoon sessions. For each session, 9 presentations ran concurrently. Each session was an hour in length with 10 minutes between sessions. The first day of the showcase, our researcher attended CMSI math sessions; day 2, the CMSI science sessions. Each curriculum was observed only once in the two day period and one was not observed at all. Schools interested in adopting a CMSI math curriculum would have been able to attend all of the 4 math

sessions. Those interested in science would have had to make a choice about which 1 presentation they would not be able to attend.

Attendance at individual sessions observed ranged from as few as 3 people (including our researcher) to as many as 15. From our 8 observed sessions in the two day period, the average attendance was 12 for math and 5 for science. Attendance at Science sessions seemed to lessen as the day progressed with observed sessions consisting of 10, 5, 4, and 3 people in addition to presenters. Math sessions, however, remained pretty consistent with 12, 12, 8, and 15 in attendance in observed sessions 1-4. Contrary to the science sessions, the observed math session with the greatest attendance came at the end of the day!

According to OMS records, __ number of schools participated in the showcase days and __ total individuals with approximately __ representing each school. OMS envisioned this as an opportunity for school teams to look at curricula side-by-side with the added opportunity of talking to vendors/users to clarify any concerns.

The structure of these sessions was fairly similar. Most started with an introduction of themselves as presenters and their relationship to the curricula (author, teacher/user, consultant, salesperson). After a brief introduction of themselves, presenters generally gave an overview of the curricula (how it was developed, program components, endorsements), led participants through a sample lesson, discussed the various parts of a lesson, and tried to highlight aspects of the curriculum that would be important to CPS teachers (use at other CPS schools, based on benchmarks/IL standards alignment, rubrics for assessment, availability in Spanish), and entertained teachers' questions.

The following is an excerpt from and interview with a principal from one of our readiness schools describing the impact of the showcase on her schools' decision-making process:

> There was a committee of many teachers of many different grade levels who went to…who sat with the vendors who went to the Museum of Science and Industry when they had the big show for Math and Science (Showcase) where you could go and touch the materials. We literally stood---you could go to all the workshops on the different curricula publishing companies—and then they had teachers who stood up and said this is what I do, this is a really neat program, this is really a good text, you know, highly recommend it. Of course you're going to listen to your colleagues, but the group of us, took probably an hour and a half to two hours…we didn't go to the last session because we were so involved with the vendors and we literally took…um, we looked at Connected Math and Math Thematics and then we focused on Every Day Mathematics and Math Trailblazers and something else, I really don't remember what it was.

From the standpoint of this participant and our observations of the 2 days of showcases, the showcase met the goals of: 1) providing opportunities for school teams to learn about research-based comprehensive mathematics and science instructional materials at the elementary and school levels, 2) supporting school teams in discussing and planning for effective selection and implementation of research-based comprehensive mathematics and science instructional materials, and 3) providing opportunities for school teams to discuss and reflect on professional development and articulation across all grade levels.

Conclusions

The commitment of the Office of Math and Science to providing high quality, sustained, professional development to those engaged in the CMSI is one of the most notable aspects of the Initiative.

Data suggests that Specialists were given consistent, ongoing, high-quality professional development training during 2003-04. Specialists were given meaningful training on leadership, materials, technology and their role. They were given time to work together and to solve problems. This type of ongoing support and training is to be commended. Missing were opportunities for Specialists to take a part in agenda setting. This was perceived by some Specialists to sometimes lead to presentations and content that was not relevant to their immediate needs. Also missing in the minds of some Specialists was the time to work in content groups to address math- or science specific questions. Lastly, analysis of agenda reveals a lack of focus on the development of content knowledge. Specialists were also critical of the time spent on housekeeping tasks, frustrated with paperwork requirements.

The teacher professional development offered in the summer of 2003 had both positive and negative aspects. Generally, teachers seemed satisfied and excited with their experiences at the curricula workshops. Teachers felt they gained both general content knowledge as well as a better handle on the content, pacing and philosophy of the specific curriculum they were to implement. Some teachers reported having a higher level of buy-in to the program and an appreciation for the consultants and teachers who led workshops. They appreciated the time to learn and network with other teachers.

The summer training did not tend to ease fears about pacing and materials management, however. And, although teachers had the opportunity to network with one another, relationships with Specialists, Coaches, and OMS Facilitators were less frequent. Teachers were concerned about how and if Specialists would be able to support implementation at their schools; they wondered if Specialists would have the skills or be allowed the time needed to support teachers in deep and meaningful ways. Because Specialists, Coaches, and Facilitators were not required to attend curriculum workshops (certainly, they also could not be at all of the workshops since several took place at the same time) there was less opportunity for teachers to develop working relationships with these people.

Although data on school year teacher professional development is limited, analysis points to some important considerations and the need for further inquiry. Data collected has evidence that the instructors shaped sessions using tenets of high quality professional development. Teachers attending sessions reflected, applied ideas, were active participants, discussed challenging ideas, and were engaged as experts to a large extent.

The workshops were set up to work well with teachers who attended throughout the school year. Schools need to be sending the same participants to the workshop across the year in order to gain the full value. Still, even with more consistent attendance, there may be good reason to reassess the format and goals for the sessions for the teachers in the non-Intensive Support schools. These teachers appear to be using the materials less frequently and have less school-based support for teaching using new standards-based approaches. At the same time, collected data suggests the need for ongoing training for newly hired teachers and consultants engaged in leading teacher professional development. Working with these new PD presenters on framing lessons and asking inquiry questions is one aspect of focus.

Observations of Principal meetings reveal high quality training devoted to topics that were relevant and useful to CMSI principals. Three barriers existed to the success of the training, according to interviewed OMS staff. In the first place, staff suggested that the training was good about telling what the principal role was to consist of, but not the "how to do it". Secondly, OMS staff felt that the principal meetings could have been used to provide principals with curriculum training that would help them to understand the role of the Specialist, how to observe implementation and a better grasp of the CMSI. Lastly, OMS staff members suggested that low attendance at the principal meetings was an issue.

Showcases were seen as a success and met the goals of 1) providing opportunities for school teams to learn about research-based comprehensive mathematics and science instructional materials at the elementary and school levels, 2) supporting school teams in discussing and planning for effective selection and implementation of research-based comprehensive mathematics and science instructional materials, 3) provide opportunities for school teams to discuss and reflect on professional development and articulation across all grade levels.

In conclusion, professional development offerings were generally of impressive quality and format. Criticisms of participants tended to focus on content and either the lack of matching of the content to participant expectations or the lack of participant input into agenda setting. Participants went to professional training hoping to receive very concrete, relevant information for their work. When sessions did not match well with needs and expectations, participants did not gain from them.

The need for ongoing evaluation and assessment of participant needs in professional development is essential to the success of this high level of resource allocation. To continue to offer the same style, type and approach of professional development for teachers in 2004-05 as occurred in 2003-04, for example, would not take into account the differences in teacher populations as teachers from probationary schools, from last year's Readiness schools and teachers in partially implementing schools will have different needs and experiences that a "one-size-fits-all" professional development will not meet. Specialist training will have to continue to evolve

and diversify to meet the needs of Specialists who are more experienced in their role versus those who are newer. The involvement of those receiving the professional training in agenda setting and critiquing the PD they are receiving is an essential component in continuing to make training deeper and more meaningful. Ongoing attention to the evolving needs in professional development for various groups involved in the Initiative must be an aspect of staff and resource allocation decisions to insure that training is worthwhile and meaningful to the populations it is serving.