

Data Brief:
Algebra Problem Solving Teachers Talk About Their Experiences, December 2004

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A brief report to the CPS Office of Mathematics and Science
From the UIC CMSI Evaluation Project
Stacy A. Wenzel
Kareem Lawal
Bee Conway
Carol R. Fendt
Sara Ray Stoelinga

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

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

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Introduction

In 2003-2004, the Chicago Public Schools (CPS) Office of Mathematics and Science (OMS) began working with district high schools and requiring a subset of students to enroll in a “double period” of algebra—90 minutes or two periods as compared to a regular 45 minute period. The targeted subset of students was entering 9th graders with 8th grade math ITBS scores below the 50th percentile. These students were believed likely to benefit from additional time spent in algebra. No specific curriculum was required for double period algebra but OMS intended that schools use two back-to-back periods taught by the same teacher and attended by the same students. However, some evidence suggests that schools carried out the program in varied ways (OMS, February 25, 2004; REA, September, 2004).

In 2004-2005, OMS more clearly specified the content of the double period algebra course. OMS staff designated 2 sets of curricular materials as required for the 45 minute *Algebra Problem Solving* (APS) course which was to accompany the regular 45 minute Algebra courses. MathScape and IMP (Integrated Mathematics Program) were the chosen curricula. Summer workshops were offered by OMS as were professional development sessions during the school year—including a full-day session for all APS teacher in IMP or MathScape in early December 2004.

Research Method

Findings in this report are based on 3 focus groups of CPS high school teachers who taught Algebra Problem Solving during the fall of 2004. These focus groups were conducted by researchers from the UIC CMSI Evaluation Project, a university-based external evaluation group with experience evaluating other aspects of the CPS Math and Science Initiative. The UIC external evaluators were asked by OMS in early December to assist with these focus groups.

During early December 2004 IMP and MathScape professional development workshops, a random sample of teachers was selected for lunchtime focus groups. An initial random sample of 27 teachers was chosen from a population of 175 teachers registered for the workshops. Not all registered teachers attended and a few who attended did not choose to participate in the focus group. Seventeen teachers participated in the focus groups—6 in two of the groups and 5 in another. There were 9 women and 8 men in the sample with 8 African Americans, 7 White, 1 Latino, and 1 Asian American. Most (N=15) of the teachers referred to themselves as experienced teachers and 2 teachers mentioned they were in their first or second year of teaching.

The teachers were about equally divided between MathScape and IMP users. One focus group was held on a MathScape only workshop day, one on an IMP only workshop day and one on a day when both MathScape and IMP workshops were underway.

The teachers represented 16 different high schools across 5 of the 6 Areas of the district. The high schools represented were similar to the district population of high schools as shown in Table 1 below.

Table 1: How Sample High Schools Compare to All District High Schools **

	High Schools Represented by Focus Groups Teachers	All District High Schools
Student population	1,473 average ranging from 500 to 2,700	-
% Low income	86% average	85% average
Ethnic composition	75% African American 21% Latino	50% African American 37% Latino
ACT comp score 2002	15.1 average	16.8% average (2003)
4-year graduation rate 2003 (ISBE new formula)	65.1% average	-
1-year drop out rate 2003 (ISBE formula)	17.1% average	13.9%

**District figures need to be checked

The focus groups met in a conference room at the Medill Professional Center where the workshops were being held and lunch was provided to participants. The lead author conducted the one-hour focus groups and explained to teachers that this was a voluntary opportunity. None of those attending the group declined to participate.

The focus group methodology has several advantages. The 3 days of workshops provided a valuable opportunity to learn from teachers who were seldom in the same place at the same time. Rather than traveling to 15 different high schools across the city, this method allowed for a glimpse of what was happening at these schools with the researcher traveling to just one location. This was also a rare time to talk with teachers during their working hours without interrupting their classroom teaching. Additionally, the focus group structure used framed the evaluation in open ended terms so not to suggest to participants that the district already had specific solutions or next steps determined for shaping the APS courses. Another strength of the focus group method rests on its allowance for participants to talk together and therefore ask each other questions and share experiences that they define as important as a group. While a researcher leading the groups can focus initial conversation on a topic, there is limited researcher control of what participants give detail on and how the conversation progresses.

Three questions were posed upfront to the groups and they were then encouraged to dialogue about these questions while the evaluator audio-recorded the conversations and at times worked to keep the conversation moving. The questions were as follows:

1. What is the relationship between *Algebra Problem Solving* and Algebra?
2. Tell me about your use of MathScape or IMP in the APS course?
How have these influenced your teaching?
3. What would you change to improve the APS course?

Audiotapes of the focus group dialogue were partially transcribed. The conversations were then read, reread, and then coded to reflect the predominate themes discussed by teachers. This iterative qualitative analysis was done by the lead author and then the resulting findings read and discussed with others on the evaluation team to consider alternative analyses.

Findings

Findings are organized to both reflect the initial focus group questions but also the dialogue based on what topics arose as most important to the APS teachers. Accordingly, findings from the analysis of the APS teachers' are presented based on the following themes:

- A. Goals of Algebra Problem Solving
- B. How APS is carried out through the classroom teaching and learning
- C. Logistical challenges and successes with APS

A. Goals of APS

Teachers in the focus groups had varied views on the purpose of the course. While views on the purpose of teaching APS was not the explicit topic posed for discussion, it became a core topic of conversation during each focus group. The conversation was sometimes focused on what APS was supposed to accomplish and sometimes on what "my students need." The conversation about the goal of APS revealed a tension between two different needs of students identified by teachers: a) the need for students to better master basic skills and b) the need to teach general problem solving skills and logic and algebraic thinking to help students better succeed in Algebra.

Basic Skills. In each focus group, conversation either began with or eventually focused for a time on teachers' frustration with their students' lack of mastery in basic math skills and the need to address this in the APS course. Characteristic of all of the teachers' comments, teachers spoke of their students' problems with basic skills in the following ways:

We get kids who don't know how to subtract and multiple.

Students need to know how to make change.

Kids don't understand the basics.

The computational barrier really holds them back.

[Students think:] 'I've done fractions for 4 years and every year when it is introduced I know I've failed--every time I've tried.'

One teacher was especially adamant and verbal that the APS course needed to better prepare students to pass their basic skills tests. He felt it was a disservice to the students to not "teach them the minimum stuff they should know how to do" so they would not get cheated in the real world. He equated these basics with what was on the standardized tests students needed to take.

What is the goal? To get these kids to pass PSAT, ACT. ... If the standard is to pass these tests, that is the problem that is to be solved.

None of the teachers explicitly said that only basic skills and not algebraic thinking skills should be the focus in the APS course but several of them, like the teacher quoted above, expressed views that might suggest they leaned in that direction. Another teacher was very clear that the district should again allow for the choice of other math courses, like Consumer Math, to be taken by 9th grade students, rather than the first required high school math class being Algebra or APS. . Another teacher, whose students were almost all designated special education, assessed on students' ability to work on task and in groups rather than on their performance in math .

Algebra Problem Solving Skills. While all teachers recognized the need to address their students' struggles in basic math skills in the APS course, most also saw the goal as larger than that and related to algebra. One key way this was exhibited was through the basic structure of the APS and Algebra courses. Ten of the 17 teachers in the focus groups taught APS and Algebra in back-to-back periods to the same group of students.¹ This was the structure suggested by OMS but not all schools chose to do this.

At times during the focus groups, teachers described the relationship of content in their APS and Algebra classes as equivalent. This is exemplified by several teachers (N=4) who spoke of teaching both APS and Algebra classes, for at least an extended period early in the school year, using their Algebra text, other materials and not using MathScape or IMP. One teacher noted that "I don't see the two [APS and Algebra] as separate."

More typically teachers spoke of APS as a way to support student success in Algebra. Only one teacher spoke emphatically that he had seen evidence at his school that APS did help students do better in Algebra class—in his case they went into Algebra taught by another teacher. The more common way teachers described the relationship between APS and Algebra was that the APS course curriculum presented math content that was similar to what was covered by the Algebra course, but presented the content in different ways.

A few of the teachers raised some problems in that the specified schedule of content coverage in APS, using IMP and MathScape, did not line up well with how their Algebra text covered the same material. One teacher also thought that presenting material in more than one way confused students.

Teaching the same thing different ways [in APS and Algebra] . . . I think they [the students] get confused by it more.

However, two teachers spoke of how these differing presentations were strengths of the APS course.

That is what we want. For kids to see they can do the same problems different ways...One kid may not understand one way, but that other kid may not understand the other way.

That is why I think APS and Algebra can benefit from being taught by two different teachers... Some students might really understand their teacher while other ones might like another teacher....And if they are stuck with one teacher for both of those [APS and Algebra], then they are really stuck in the dark.

Other teachers (N=3) noted that the APS focus on problem solving logic and reading skills was the key to how it could help students with Algebra and other courses. For example one teacher explained this concept as follows:

I don't think this class was really meant to teach them Algebra. It is called *Problem Solving*. It helps them with their reading. But it's the logics and how to begin a problem. How do I solve it?

B. APS Classroom Teaching and Learning

How was the APS course carried out by teachers and what can be learned about how this implementation is helping their students work toward success in Algebra and toward better mastery of basic skills? Teachers spoke about several strategies they used and how these played out in their classrooms. They discussed issues related to (a) the pace and depth of material coverage, (b) the ways they needed flexibility in how they taught the APS and Algebra lessons, (c) how they worked with special education students, (d) using supplemental materials to teach basic skills, and (e) using calculators.

¹ Three of the 16 focus group teachers stated that they did not teach back-to-back APS and Algebra and 4 other teachers did not describe their teaching situation clearly enough to determine one way or the other.

Pacing and Depth of Coverage. There was a consensus that having 90 minutes to teach APS and Algebra was beneficial. No one voiced the view that it was problematic to require extra math for students with a record of low achievement in math—unlike some teachers’ views in 2003-2004 (OMS, February 25, 2004). However, some teachers (N=5) expressed difficulties in getting this extra time to translate into more or deeper coverage of algebraic content.

In one of the focus groups a great deal of conversation centered on this issue.² One teacher expressed this as: “They doubled the time but cut it in half.” She appreciated the 90 minutes for Algebra and APS compared to the 45 minutes in the past for only Algebra. However this time now was supposed to cover twice as much material given the structured materials to be covered in APS using MathScape or IMP. Teachers spoke about the dilemma they faced in terms of wanting to use IMP and MathScape with their more inquiry-focused style but feeling they cannot get their students through that material quickly enough. One teacher blamed her students’ lack of basic math knowledge with derailing her effort to use the APS curriculum to cover material thoroughly and in a timely basis. She explained this as follows:

I gave a lecture in MathScape. . . because [the students] didn’t know the basics they couldn’t come up with the equation. . . and I ended up giving them the equation. We spent 40 minutes on that . . . wasted time.

Another teacher was more empathetic to the intentions of the APS curricula but still was not able to make it work.

But I understand where the Board is coming from because we never get to chapters 9, 10, 11, 12. We never get to the second half of the algebra book. In order to get to the second half of the algebra book, we need to get through the first half faster. I understand. But at same time. . . If I follow their guideline, I’ll get to polynomials by week 35 but [the students] won’t understand what an exponent is because I will have only had a day or two to go over it. . . . I really like the MathScape. They need this discovery. They need the hands-on. You know what? It takes 6 weeks to teach slope through concept discovery. It takes 2 days to teach slope through $(y_2 - y_1)$ over $(x_2 - x_1)$. But they don’t have any comprehension. But to build that comprehension we need the time. They are asking us to build comprehension in less time than we had for skill and drill.

Yet another teacher in this group was very straight forward about not choosing to use the inquiry method of teaching math for his APS course.

I do not let my students plot points. I show them how to do it, but I tell them all they need to know is the slope is the rise over the run. And the b is the y-intercept. Then they have the line. But I do that because it works. I don’t want someone down here to tell me you shouldn’t do that. Let’s get real!

Flexibility in Teaching Lessons. Teachers in each of the three focus groups commented on how they attempted to cover the material in their APS course in a way to complement the Algebra course. For some teachers (N=9 of the 16) this meant they verbalized how they wanted to use, for example, up to 90 minutes of contiguous time to do IMP or MathScape one day and then another day 90 minutes of algebra and/or that they wanted some flexibility to change the order of when topics were taught in APS so to better prepare students for when they would see related topics in the Algebra course. One teacher’s comments were typical of this sentiment.

I have 90 [minutes] of math. I don’t stop at 45 minutes and go to different curriculum. I have 90 together. My students are never ready to stop after 45 minutes. If they are into what they are doing, it does them a disservice to stop at an artificial 45 minute break. . . . There needs to be

² In the other 2 focus groups, no one elaborated on any concerns for the pacing or depth of which they covered the course content. However, no one noted that they found it easy to get the class to cover material quickly or deeply. The conversations centered on other topics.

flexibility, if what we are doing is flowing, we need flexibility to use MathScape for 3 weeks and then 2 weeks with other Algebra curriculum.

Serving Special Education Students. In two of the three focus groups, teachers considered how in their APS courses they dealt with high proportions of special education students.³ In one group, the teachers gave credit to APS and MathScape as a potentially good way to teach the special education students. One teacher noted that her students liked the MathScape lessons, and she liked that the lessons were challenging and not “dumbed down.” However, she also noted that she was not pleased to discover that MathScape was not designed as a high school curriculum but as a middle school curriculum. Another teacher in this group had yet to begin using MathScape with her APS (due to miscommunications at her school), but she said she had volunteered to teach the APS course to the special education students because the other teacher who started the year teaching it was so uncomfortable with math that no math was being taught in the course.

In the second focus group, the ways that APS courses worked with special education students was a major topic of discussion. In this group, there was one teacher who was certified to teach special education and math. Her concern was that she needed to start the year with a review of basic math so that little time in the year was left to cover the APS curriculum. However, another teacher, who was not certified to teach special education, shared a story that sparked a great deal of concern among the other teachers. This teacher told how when she arrived for the first day of class she found that almost all of the students were special education—some with developmental and some with behavioral disabilities. No additional special education teacher or teacher’s aide co-taught this course with her. The explanation from the school was that they were all put in this APS course so that their regular special education teachers could have a free period. The other teachers in the group were outraged by this and remarked on how this violated NCLB compliance rules, the students’ IEPs, and the law.

Teaching Basic Skills. Many (N=10) teachers spoke explicitly about how they tried to help their students improve their basic math skills during the APS course. Most teachers began the year with a review of basic math and/or reviewing basic math concepts periodically during the year. None of the teachers spoke explicitly about whether the basic skills could be taught within the intended MathScape and IMP lessons. No one made the case that the teaching and learning of these skills could be found embedded within the intended curricula. In fact, one teacher pointed out that one of the trainers offering professional development in IMP acknowledged that their materials did not cover the basic skills and suggested that perhaps another one of their company’s curricular products could be bought to help supplement the learning of basic skills. Typical of these comments about working with students on basic skills was this teacher’s comment about how the design of APS did not address the need for teaching stronger basic math skills.

As a department we start with a basic review of math and throughout Algebra I am constantly reviewing within. I understand the pressure. We need to get CPS achievement higher. But it seems like people are throwing everything and anything at the problem without anyone addressing the problem.

The teacher most adamant about the failure of APS to address student needs for work on basic skills commented on the mismatch of APS and the teaching of basic skills.

Part of the problem is that the Prairie State, it deals with fractions, manipulating numbers. These little blocks [used in IMP and MathScape] are not going to help them manipulate numbers. I’m not saying they don’t have their place, but this is like someone has an idea these blocks are going to solve all the problems of the world. Therefore, this is the new buzz word. But hey, tomorrow we will think of something new.

³ In the third focus group, they did not refute that serving special education students was an issue. However, their conversations did not touch on this issue and centered on other areas.

Using Calculators. Yet there were some teachers (N=4) who, while acknowledging their students' weaknesses in computation, combated this not with just additional review of computation but by getting students to use calculators. The dialogue between two teachers is particularly illuminating about why some wanted to use calculators. One teacher noted how her students think, "I've done fractions for 4 years and every year when it is introduced I know I've failed--every time I've tried." She said, "I wouldn't put in any effort either [if I were these students] and I'd want to cut that class. So that is why we use the calculator." The second teacher added:

The computational barrier really holds them back. When they do understand the concepts, they have to prove they understand the concepts through computation. It is very unfortunate.

The first teacher replied:

And computation is such a very small part of math. And yet we spend so much time and energy on it. That is why I give them calculators. They do understand it. They know what slope means. They know how to solve equations. They can get the answers right because they use a calculator.

C. Logistical Challenges and Successes with APS

One teacher did not feel comfortable either critiquing or giving praise to the IMP or MathScape curricula. She did not feel that she or teachers she knew had a fair chance to use the curricula yet.

We can't even get to the program because of all these other structural issues. I feel we are not giving the curriculum justice.

The focus group teachers were generous in sharing their thoughts about their logistical challenges and successes in teaching the APS course and using MathScape or IMP. These logistical issues included the (a) communication process between the district offices and the schools, (b) the quality of the professional development for APS teachers, (c) the school programming of teaching assignments, students and materials, and (d) the balance of maintaining flexibility for teacher professional practice and accountability procedures.

Communication from District. Conversations within the focus groups suggested that some teachers had a fairly accurate sense of district math policies while others did not. For example, in one focus group one of the teachers informed the others about the change in district policy that will allow students to move into high school even if they do not perform at the specified standard level on the math ITBS—basing grade promotion only on reading scores. The other faculty had not heard of this policy change.

In another group, teachers spoke about the need for the district to more clearly specify how the APS and Algebra courses could be organized for the best benefit to students. One teacher found these lines of communication lacking.

There are people here today [at the APS professional development workshop] that didn't realize that scheduling [of APS and Algebra courses] was up to the school...They thought the district said, "You should do it this way." The thing that bothers me is that I see people from CMSI shrug their shoulders when they hear it and say, "Well, that is up to the local school. It's not our concern and it's up to the local school to figure out." And I think OMS does have a role in at least making strong suggestions: "this is how you might want to implement."

Quality of Professional Development. Teachers in the focus groups were not asked to comment about the professional development workshops they took during the school year and summer 2004 workshops for IMP and MathScape. Yet at least eight teachers spontaneously commented—making both positive comments and also some critiques. These included the following comments—from eight different teachers:

About being sent to the wrong session.

- [At the summer workshops] They sent us to the wrong room. [IMP instead of MathScape]

About the strength of the professional development for MathScape and IMP, but the need for more time to reflect on what is learned.

- Providing this training has been wonderful. This is only my second year [teaching in CPS], but it seems kind of unusual that they would give us materials and training on how to use it. That's been a really positive sign. But we are professionals and just like we want the children to be able to do concept building--because going through the concepts themselves they become better students. I don't see why that does not get applied to us! Let me sit down with the curriculum and figure it out. . . . I wish we had more of this professional development over the summer, and it was more flexible, and we were more involved. I get really tired. This has been one of the best workshops I've ever been to. We actually participate.
- One of the drawbacks to what we are doing right now [is]we are pulled out so much from the classroom. We are required to do so many meetings. We don't have the time to think about our curriculum. I just wish I had more time...I need to be there for the kids...We were pulled out one day just to talk about last year's scores on the ACTs. We had a whole inservice on that and missed 2 classes. If you are part of the Walk Through team, you miss a whole day of classes. We are always meeting. . . This one [workshop on APS curriculum] is good. I am never bored . . [in comparison to a summer STEP UP professional development session] they did 'downstairs' in a room where we couldn't see the video; we couldn't hear. It was horrible. We did one problem the whole day. And it took us 20 minutes to do the problem and two hours to do the presentations. (said with sarcasm) Now this is what we are supposed to do in our classrooms and still stick with their guidelines [for pacing]. There was nothing there I saw that I'd want to take back and model. . . But this one up here is very good.
- I agree [that this workshop is very good].

About the need for clear implementation guidelines, more active participant participation and more feedback from workshop leaders during professional development sessions.

- [During the summer workshops they gave us] a timeline which was kind of generic. It said like you should be here day 22. Something like that would be more beneficial than having to deal with the paper pushing because every time I turn around, "ok, track this." I hate that. I hate that and the videos. Don't show me a video about how to implement stuff. Give me something where I can go participate and see it in motion.
- One good thing I've seen in these workshops is they will give us random draw cards and put us into a group, and we are going to sit here and do the checkerboard problem. Then we will present our solutions. And the teachers are going to play the role of the students while the people facilitating play the teachers . . . I felt like the facilitators haven't given us much feedback on that sort of tactical stuff of "here's how this breaks down." A lot of time at these meetings, [we] use time to (complain). Maybe we should have a session focused on what is working--a voluntary one.

About help from the Area Math Coach.

- Our guy [Area Math Coach] is pretty helpful. He has set up a few of these group things where we can work out some of these things ourselves. He's helpful.

About too little time.

- We just don't have enough time. We have meetings (too many). We have a meeting every week on how to teach reading.

School Programming of Teachers, Students and Materials. Teachers told stories of well organized programming at schools and serious problems in programming. On the positive end of the spectrum a teacher described his school's situation as one with strong teacher input into program decisions:

The whole thing is communication within the school and how well you get along with the programmer. How well you get along with the principal. . . We have a wonderful department chair now and he gives us all the information now. He says we have these sorts of programs and asks, "Would you like to go?" And we usually go as a whole department, which is great. We've had no problem with getting support from the school. We tell the programmer what we want. And if it's possible, she will do it. We wanted it [APS and Algebra] back-to-back this year. We talked about it as a department. We didn't have to have it back-to-back. We could have had separate periods. But we did want it that way because we figured we could use 2 periods to do IMP one period if it's a long problem that takes a longer time than one period, and we can finish it off. For the first marking period we did one period Algebra and the other IMP. Now we decided on Tuesday and Thursday we have just IMP the whole period. It seems to be working pretty well.

At another school, the teacher thought he had a similar positive situation where the school was organized with the right materials and sending the right teachers to training sessions. However the problem arose when it came time to place students in the APS course. The teacher explained that he was surprised when the semester began.

I was really motivated for the program, but when I showed up for class and I looked at my special education list and had 15 special ed. students-- a terrible situation. And I went down and complained about it and was told that "Since this is a NOT a required course, we are using your course to take all the special ed. kids who normally are in self contained [courses] and giving them to you so that the special ed. teachers can have a period off."

Other teachers noted that their schools had other internal programming and communication challenges. One teacher explained that she had been teaching APS all fall, yet no one at the school had told her that she was supposed to be using MathScape. She found this out when she attended her first APS workshop in December 2004. That day she also learned that her school had the MathScape supplies. She just needed to go ask the department chair for them. Other teachers faced similar situations.

However, other schools were not even able to get the right materials into their buildings on time. One teacher explained that she had to buy all the manipulatives for the first unit since the schools' supply had not come in. Another teacher told how he received 30 sets of teacher blocks instead of student blocks. Of the six teachers in one of the focus groups, only one had all of the supplies needed at the start of year. He credited this to the preparation he got during the summer professional development workshop.

Balancing Flexible Professional Practice with Accountability. Teachers in two of the focus groups referred to some pressures placed on them by district officials outside of their school to follow a prescriptive schedule for when and how APS and Algebra content must be covered. One teacher described the problem as stemming from the Area's demands for compliance to a strict schedule.

People at CMSI somehow convey a message to our Area. The Area filters it in their way and they put pressure on us. "You have to do this and you have to do it for a 45 minute time." [I think] There needs to be flexibility. . . We need this flex without all this pressure from the Area or from the principal or assistant principal telling us that we need to do something different. The creative part of teaching is being pulled from us due to pressure from up top. [There is] immense pressure on my principal from the Area people.

All of the other teachers in this focus group showed their agreement by nodding their heads and then adding their own stories. They then elaborated on their own similar experiences. A second teacher stated that

Area Coaches need to BACK OFF! (Applause from another teacher). We were given a time framework/ schedule for what to cover in Algebra. And they want rate of change, slope, linear equations, linear inequalities, and systems of equations done in 5 weeks. And we have a day-by-day schedule for MathScape. Day-by-day. Our Coach came in on the half day before [a holiday] and saw a new teacher who was not using MathScape. . . She was doing a worksheet. She is having management problems. The Coach ripped into her for this.

She went on to describe how the professional development trainer that day had noted that you do not want to do MathScape in 45 minute slices. It is better to do a chapter from your Algebra textbook and then a unit from MathScape. The teacher wanted the Area Coaches to understand that philosophy. Instead, she remarked, “They are regimenting every thing we do.”

A third teacher confirmed having this same experience and spending a great deal of time figuring out how to “defend herself” by documenting with assessment data why she covered material with students at a pace other than that specified. The second teacher went on to elaborate on how the specified MathScape pacing plan was unrealistic given the amount of material that they were expected to cover even before the 21st day of classes—the day when students programs are set for the year. A fourth teacher in this focus group responded to this dialogue by saying, “I resent having someone who has never been in a classroom telling me how to teach.” He later remarked, “Leave us alone. Let us teach.”

Discussion

These focus groups were conducted and analyzed with skill and care, but in isolation from any larger evaluation strategy to understand the Algebra Problem Solving courses or other aspects of the CMSI high school activities. Given this limitation, we are cautious as to the extent to which we can make comprehensive conclusions or recommendations based on these data. Instead, we have presented the findings as descriptively as possible so that CMSI leaders can make sense of them in the context of other data they are collecting. However, there are a few general comments we make given the strength of the findings in a couple areas. First we comment on the evaluation method and the process of the focus group conversations. Then we highlight a few of the key findings and offer suggestions on how to attend to some of the APS teachers’ concerns.

First, the use of focus groups as a means for eliciting descriptions of teacher experiences with APS courses found success though not always as intended. It was clear that the teachers appreciated the opportunity to comment with the groups on their experiences with teaching the APS course. The conversations within the group were animated and candid. The focus groups could have easily continued past their one-hour sessions if the evaluator had not encouraged the teachers to return to their workshops. Several participants remarked that they were pleased that OMS was asking for their views through these focus groups.

Yet the focus group conversations tended to center heavily on issues that may not have been the intended topics that OMS wanted teachers to comment on in these focus groups. For example, teachers did little talking about the type of teaching and learning they are doing using MathScape and IMP despite being asked to do so. Still, though unintended, this trend in the conversation illuminated a couple issues about the experiences of APS teachers. Several (N=4) of the teachers admitted that to date they had not used the MathScape or IMP curriculum either by choice or because they were not aware that it was available to them. Other teachers felt that due to the challenges they faced with getting materials, dealing with accountability requirements, or handling large proportions of special education students that they had not to date been able to “give the curriculum justice” in terms of trying to implement it properly. Given that these teachers who had not yet used the curricula or who were struggling with logistics were very verbal in the groups, those who had experiences implementing the materials did not take the opportunity to talk at great length about implementation. One teacher suggested that this phenomenon was actually present in the larger workshops they were attending, and he made a thoughtful suggestion.

A lot of time at these meetings is used to complain. Maybe we should have a session focused on what is working--A voluntary one. Without the hour complaining about the elementary school teaching, etc. It could be an IMP leadership group.

We echo the sentiment of this suggestion. While we believe the focus groups we conducted offered valuable insights into the experiences important to APS teachers—and thus issues we think need the serious attention of CPS leaders of the CMSI and high schools—alternative focus groups or data collection methods would be needed to gather different types of data. For example, a subset of APS teachers who are trained, have proper materials, and are trying to implement the IMP or MathScape curricula in earnest would be a better group to convene in a focus group, interview individually, or observe in action if one wanted to get a better description of how these curricula are working in the classroom and how they may influence teaching strategies.

In terms of key findings, we highlight issues of the implementation of IMP and MathScape in APS, early professional development for all APS teachers, and clarifying for all teachers and high school staff the goal of the APS course.

Teachers expressed an overall desire to have flexibility to determine how to utilize the 90 minute periods that many of them had for APS and Algebra. In some schools they had their department's consent to adjust how they covered APS and Algebra in a given day or from week to week. These teachers appreciated this flexibility. However in other schools teachers felt quite unhappy with their Area Coach who expected them to maintain a regimented scripted pace with the curriculum. Yet the desire for flexibility was not without some qualification. Some of the teachers complimented the MathScape and IMP curricula and one teacher actually wanted even more help to understand the pacing goals for these curricula. More clear guidance from OMS is needed so that all departments and teachers understand the ways in which they need to hold faithful to specified pacing guidelines and the ways that they can use their professional judgment to adapt APS curricula to best work with varied Algebra texts and varied student populations.

In terms of professional development for APS teachers, there are a number of issues raised. On the positive side, there were some compliments on the quality of the professional development workshops being attended the days of the focus groups—though several teachers did not care for all the complaining taking up the workshop time. However, it was clear that many of the teachers had not attended training during the summer for the APS curriculum. The primary reason for this seems to be that teachers did not know they were teaching APS until the fall or were not informed about the summer workshops. A better process for reaching all APS teachers—if not in the summer then first thing at the start of the school year—is necessary.

Perhaps because of their absence at summer workshops, teachers expressed some uncertainty about the goal of the APS course. The discussions about how the course was supposed to address students' lack of basic math skills and the large proportion of special education students suggests to the evaluators that OMS intentions for this course need to be more strongly communicated with the APS teachers. Only a small number of teachers (mostly those who had attended summer workshops) articulated a more informed sense of the intentions for the course. For example in one session an APS teacher argued with some of those dismissing the value of APS by reiterating that the course

is giving [the students] the opportunity to look at math a little bit differently. . . get them to analyze problems. . . with APS and Algebra you get the opportunity to teach two kinds of ways. The classes feel rigorous enough. . . Don't just write an answer. Tell me what you are doing. Analyze.

Yet even those who took a role of defending APS in the focus groups were sympathetic to the concerns raised by their peers. In another session, after initially praising the APS course strategy and then hearing other teachers complain about the course's ability to address students' special needs, one teacher remarked with a tone of confusion:

What is the true focus on the curriculum? Creating the course in the first place [for] these low performing kids. Then you go and use something [the IMP materials] that is above their grade or whatever level? This is the first time I every heard this. What is the purpose? It seems like the

focus is totally different. If you are telling me I'm supposed to get these kids up to standards with the rest of the regular class then why am I doing something that is totally foreign?

The teachers in this focus group needed to hear why and how OMS chose IMP and MathScape, how specifically they were intended to help students achieve in Algebra, and how these materials were particularly able to address the needs of special education students. For example, documentation on the process of selecting the materials may be available for sharing. OMS has shared similar information with AIOs and principals about the selection in spring of 2004 of instructional materials for the three required, regular-level high school mathematics courses (Memo on High School Instructional Materials, April 5, 2004).