

## Evaluation of the CPS High School Two-Period Algebra Course, Spring 2006

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A Data brief for the CPS Office of Mathematics and Science  
Prepared by the PRAIRIE Group, UIC College of Education<sup>1 23</sup>

This is the second of two external evaluation data briefs on Two-Period Algebra (TPA). In the first brief (February 2006), we documented the views and roles of key district and sub-district instructional leaders around TPA. In this data brief, we draw on interviews with math department chairpersons and math teachers of Two-Period Algebra from six schools. Schools were purposively sampled to include schools that the Office of Math and Science believed to vary in terms of stronger and weaker implementation of TPA. This data brief adds to a body of evaluation research work around TPA that has been and will continue to be conducted by both OMS and external evaluators at the PRAIRIE Group at UIC.<sup>4</sup>

### Research Method

The evaluation research conducted for this data brief has been framed by fall 2005 initial external evaluation questions below

Initial Fall 2005 TPA Proposed Evaluation Questions
<b><i>Goal: To Understand Structure and Mission of the Two Period Algebra Project</i></b>
1. What is the theory of action of the Two Period Algebra Project?
2. How do the various staff members and stakeholders involved express their vision of the project to be carried out?
3. How elaborated and coherent are the plans with other CMSI activities?
<b><i>Goal: To Understand School Support Roles</i></b>
4. What are the roles of the OMS staff and Area Math Coaches and AIOs in terms of support of this effort?
<b><i>Goal: To Understand Partnership Effectiveness</i></b>
5. What factors contribute to and hinder the successful teaming of the OMS, Area and high school staff in terms of successful support of Two-period Algebra? How do the various actors adapt/modify their support/collaborate with each other to overcome obstacles to implementation? Does this improve over time?

and in terms of interview questions used by external evaluators with math chairpersons and TPA teachers. These interview questions were created in collaboration with OMS internal evaluators and with attention to their recent spring 2006 internal evaluation findings on TPA. The interview questions included:

Spring 2006 TPA Interview Questions for Department Chairpersons and TPA Teachers
A. What are teachers' experiences teaching TPA and how did they come to that assignment?
B. How are students chosen for the class? Especially with the borderline cases?
C. Do teachers know how many special education students they have in your classes or who they are? Have teachers had any training regarding incorporating students with special needs into their class? Do TPA teachers co-teach with a special education teacher?

<sup>1</sup> For further information, contact Stacy Wenzel, [swenzel@uic.edu](mailto: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.

<sup>2</sup> This report draws on a collaborative effort of many PRAIRIE Group staff member including those who helped to collect data in school, conducted initial analyses, wrote the report and edited the report. Among the contributors are (alpha): Meghan Burke, Minerva Cruz-Familiar, Carol Fendt, Crystal Laura, Mariam Mazboudi, Gregg Mossberger, Lisa Raphael Bogaert, Geen Tomko, and Stacy Wenzel. Authors can be cited as Wenzel, Mossberger, Burke, Cruz-Familiar, and Mazboudi.

<sup>3</sup> This report is based upon work supported by the National Science Foundation under grant No. 0085115.

<sup>4</sup> For example, see the OMS documents: 2005 Two-Period Algebra Classes Evaluation Plan Overview (April 12, 2005) and Two-Period Algebra Memo: Early Indicators of Implementation in 2005-2006 (November 1, 2005). An earlier PRAIRIE Group memo on a previous course related to TPA also gives background: Data Brief: Algebra Problem Solving Teachers Talk About Their Experiences, December 2004 (January 4, 2005).

Does the special education teacher have any math training? Have they attended any PD for TPA? How do TPA teachers differentiate instruction in the classroom, and meet students' special needs
D. What techniques have teachers found to be particularly effective for keeping students engaged for the full 90 minutes? What techniques have they found to be less effective? What type of activities do they use the extra time for in TPA?
E. What assistance have teachers received, and from what sources, to prepare them for the special challenges of Two-Period Algebra? Do teachers have anyone with whom they co-plan or co-teach? Has anyone come to their classroom to provide instructional support? What kind of support did teachers receive?
F. What aspects of Two-Period Algebra have worked well for teachers and their students? What needs to be changed, stopped, or continued to make this course successful? How will teachers know if it is successful? What support should CPS provide to help teachers get there?
G. Does TPA influence attendance? If so, how?
H. Would it be helpful to have a common 8 <sup>th</sup> grade end-of-year exam in mathematical content knowledge to use for placement into high school math classes, including TPA?

Given these framing questions, analysis focused on understanding important themes related to how schools carried out the TPA program according to their teachers and department chairpersons. We describe findings according to these themes of how

- Students are placed in TPA
- Teachers teach TPA
- Teachers effectively use the 90 minutes of TPA class time
- Special education students are supported in TPA
- Teachers experience district and Area support services

**Sample.** In the 2005-2006 school year, approximately 72 (of the total of 85) high schools in the Chicago Public Schools (CPS) district offered Two-Period Algebra (TPA). This course served over 10,000 students and was taught by over 300 teachers.

Schools were purposively sampled for this evaluation to include schools that the Office of Math and Science believed to vary in terms of quality of the implementation of the TPA. The Office of Math and Science Facilitator for the TPA program created a list of 7 schools he believed had strong implementation and 6 schools he believed were facing more challenges in terms of TPA implementation. From this list, 3 schools were excluded because they were part of internal evaluation work conducted by OMS. From the remaining 10 schools, one more school was dropped from the sample because it was a very small school where all grade 9 students took TPA and none took Algebra. The remaining 9 schools (6 from the strong group and 3 from the challenged group) were assigned to members of the external evaluation team. Team members were not told if these schools were from the strong or challenged group of implementers as identified by OMS.

The math department chairpersons of the schools were initially contacted by phone, email and by in-person visits to the schools. Interviews with the chairpersons and focus groups with the TPA teachers were arranged and conducted during May 2006. Interviews were audio taped and full or partial transcriptions created. Schools were compared across the themes targeted by this analysis. Three of the targeted schools were not visited because the researcher was not able to arrange meetings with the department chairpersons during May.

In all, six schools were visited. These visits allowed evaluators' access to six department chairpersons and 17 teachers. The number of interview participants at a given school ranged from one person at one school to seven at another school. In total these schools offered 33 different sections of TPA. The schools ranged from small schools to very large high schools. They were distributed across the city geographically. The following Table shows the range of characteristics of these schools. Approximate characteristics are used to avoid disclosing the confidential identity of the schools visited.

School	# Students	% Black	% Hispanic	% Low Income
A	300-400	85%+	10%+	~95%
B	Over 1100	95%+	< 5%	~95%
C	Over 3000	25%+	50%+	~90%
D	900-1000	95%+	< 5%	~100%
E	700-800	95%+	< 5%	~100%
F	Over 1500	95%+	< 5%	~75%

## Findings

We report on how teachers and students were assigned to TPA courses; how TPA teachers used the 90 minutes of class time and served the special needs students in their course; and how TPA teachers experienced supports provided to them by district and other resources.

### TPA students

The most common explanation by math chairpersons and teachers of how students were placed in the course was that placement was determined by grade 8 test scores (those 45% or below the standards go to TPA) and then the high school programmer was responsible for assigning students to classes. However, some of the department chairpersons or teachers indicated that the high schools did deal with borderline students. The person(s) who had responsibility for appeals or waivers or borderline placements varied greatly across schools and across the perspectives of different people within a school. The variation included reports that:

- Grade 8 teachers makes placement decisions when a student appeals
- Summer school teachers working with students before they enter grade 9 make recommendations
- Elementary school principals can give students waivers out of TPA even if test scores place them in the course
- A high school department chairperson pulled two students out of TPA and moved them into one-period Algebra given their early performance in TPA
- The assistant principals at one school were credited with making the TPA placements
- Programmers placed students by test scores and, in one case when an appeal was made by a student to the high school, the chairperson turned the appeal decision over to the programmer
- An experienced double-period algebra teacher made the student placements in TPA over the summer
- Some teachers were not sure who made the student placements
- Some teachers assumed the placements were made totally randomly
- Some teachers saw late enrolling students placed into TPA because there were spaces open in that course

Across all of the schools, teachers remarked that there were some students who seemed to be in the wrong algebra course. There were TPA students who were very bright and quick to learn algebra and regular Algebra students who were having great difficulty learning algebra. A teacher at one school remarked that the students “seemed like they were randomly chosen” for her TPA course and her Algebra course. Across the schools TPA teachers noticed a wide range of math ability.

While teachers at all schools noticed a range of student abilities within TPA, at some of the schools more than others, the teachers spoke emphatically about student struggles and, in some cases, problems with students’ attitude. These teachers shared a view that their students were struggling with basic math. For example as one teacher explained “our average student cannot add, subtract, multiple or divide without the assistance of a calculator ... and they can’t estimate either.” At another school, the department chairperson felt the TPA students were weaker than other students in terms of reading ability and number sense. At two of the schools, the teachers also commented on a general lack of motivation among TPA students. At one school the one TPA teacher noted that they had “deficient” students who “don’t value education.” Another TPA teacher voiced (and the others in the focus group agreed) that there are many students at the school who were “just waiting to graduate” and were, therefore, not engaged. At another school, one TPA teacher called the students “lazy” and another explained they were “not motivated for school,” “needed an attitude adjustment,” and “were very satisfied with a D.” A teacher at one of these schools summed up his feeling that the elementary schools need to “send us a better product.”

### Discussion Questions

What are the pros and cons of the current situation where borderline students appear to be assigned to TPA using a variety of processes? Should there be more standardization of this process? If so, how might the district better communicate the desired process and work with elementary and high schools to implement this?

What are the implications of some of the views TPA teachers have about student struggles and attitudes? How can OMS evaluation on student achievement related to TPA confirm or contest or provoke dialogue about these views?

Considering that teacher attitude and expectations have a lot to do with student success, what can OMS and CPS do to foster in TPA teachers a more positive attitude regarding their students?

## TPA teachers

The following is a brief overview of the 17 teachers teaching TPA in the sampled 6 high schools. We review how these teachers were chosen to teach TPA, their teaching experience as well as their experience teaching TPA, and finally, what teachers generally liked and disliked about TPA.

The teachers for TPA courses came to these courses through various paths—some volunteered, but more often they were required to teach TPA. At most schools, teachers came to teach TPA through both routes. Initially although the chairperson at this school told evaluators that all of the teachers volunteered, 4 of the teachers volunteered and 2 were “drafted.” At another school, the teachers indicated to the chairperson that they wanted to be assigned TPA. At other schools, teachers were typically assigned to teach TPA with no choice. At one high school, despite some version of a double period course being taught at the school for a few years, in 2005-06 all TPA teachers were teaching the course for the first time.<sup>5</sup> Further, they reported that they did not even know they were teaching TPA until a few days before school (and they did not get their texts for TPA until November). One of these teachers described her feelings on being required to teach TPA:

It was mandated and I did not want to teach it. Because freshman are crazy and 90 minutes is a really long time. And it is the lowest level kids. There are more behavior problems.

One of her colleagues agreed and noted that he would have preferred teaching special education students (who were not assigned to TPA at this school) because they had many fewer behavioral problems than did the TPA students.

What types of teachers were called upon to teach TPA in these schools? Most were fairly new teachers: nine had taught between 2 and 6 years and five were first year teachers. Some of the teachers with multiple years of experience were in their first year at a new school. Just three of the 17 TPA teachers were veteran teachers with 15 or more years in teaching. Of the six department chairpersons interviewed, only one taught TPA in 2005-06. Four of the 6 schools offered a form of double period algebra to 9<sup>th</sup> graders in previous years. However, from these 4 schools, only 5 teachers had actually taught the double period course prior to their 2005-06 experience with TPA.

Of the teachers who volunteered to teach TPA, we know only a little about reasons why they did so. These reasons included:

- After volunteering to teach in the STEP-Up summer math program, it sounded interesting to one teacher to teach TPS which drew on some of same ideas about teaching math as STEP-Up
- A colleague at the school who was teaching TPA invited one teacher to also teach TPA
- Teachers who wanted to teach grade 9 students in schools where most of these students were assigned to TPA, needed to teach TPA

## Discussion Questions

What makes TPA a course that veteran teachers do not volunteer to teach? What makes it a course that teachers do not choose to teach two years in a row? How might this pattern be changed?

## Effectively using 90 minutes for TPA

In 2005-06, TPA was designed as a 90-minute contiguous class each day of the week. One teacher was to instruct the full 90 minutes. Teachers were asked to use a TPA guidebook prepared by OMS that offered information about how to relate lessons on algebraic thinking found in Mathscape and IMP curricular materials with the chosen Algebra text used at the school.

Teachers who were familiar with earlier versions of Algebra Problem Solving or Double-Period Algebra expressed their opinions about whether TPA was an improvement or whether early models of the course were better. For example, at one school the teachers all preferred that the algebra was now taught in back-to-back periods while at

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<sup>5</sup> According to these teachers, for 2006-07 the plan is for only one of them to teach TPA again and therefore all other sections would again have brand new teachers.

other schools, the teachers preferred the previous design where the two periods were not back-to-back, and not always with the same teacher.

But regardless of whether they liked it or not, TPA was being taught in these schools for 90 minutes straight with the same teacher. The challenge of this was expressed succinctly by one department chairperson who had taught the double period algebra in the past but was not doing so in 2005-06. She remarked:

It was so hard to keep it going for 90 minutes .... [to] figure out how to keep it going and make it productive time. Rather than doing the same stuff we were doing in one-period Algebra.

*From the teachers and chairpersons interviewed for this evaluation, what hints do we have as to what works and what does not work for teachers trying to successfully help students learn during these 90-minute sessions?*

Getting students to attend class for the full 90 minutes was important. Most teachers interviewed for this evaluation did not express concerns as a group that TPA was atypical in terms of attendance issues. A positive exception was at one school with block scheduling, where a teacher saw TPA's 90-minute format as a positive issue because they taught the course every day, rather than only the few days a week typical for other courses using the school's block scheduling. Even a student who was absent during the week would be more likely to be at school on a day when TPA taught. A negative exception was mentioned by a couple of teachers who noted that giving students who did not like math two periods of math was cause for more absenteeism. One teacher noted that in his first period TPA course that around two-thirds of the students were going to fail the course for having more than the allowed number of CPS absences. Even for first-period courses which often suffered attendance problems, this seemed excessive to this teacher. More commonly, teachers across the schools thought of attendance related more to whether a course was taught in morning or afternoon. Their criteria for what constituted an absence or a tardy varied from teacher to teacher and did not appear to have anything to do with the special 90-minute format of the course.

Having 90 minutes rather than 45 minutes for Algebra was seen as a positive step by some of the teachers and chairpersons—but not by all of them. Some teachers remarked that it was difficult for students who did not like math to have a double period of it. The teachers at one school talked together about how they thought their students had the “stamina” for working on math exercises for a maximum of 30 minutes at a time. They thought their students were not performing well in math because of an inability to focus for longer periods. This, therefore, set up a “backward concept” because students in TPA needed to spend an extra long period doing math.

Many of the teachers and chairpersons interviewed commented positively about having 90-minute periods. It gave “kids time to do their work” according to one chairperson. More than time, it was the quantity of learning activities that students could experience that offered the potential benefit of TPA for others at the schools.

The fact is that we have had the opportunity to give them additional activity to help them learn. Not just the fact that they have an increase in time. People can waste time or do the same thing for ninety minutes. What has worked well is when the teachers have done different activities to help students learn. I know our failure rate for algebra has gone down as of the first semester. We are hoping that is one of the reasons people are passing algebra because they are now trying some things they did not try in the past.

A few of the teachers also remarked that the TPA curricula were good and that those students who were “motivated” benefited from the Two-period Algebra course.

What were some of these activities that teachers found to help students learn over these double periods? One chairperson described the situation:

We try to deal with the skills that [students] should have had, but did not. That is the difference; they are still getting the algebra materials at the same time they are getting the stuff they did not learn before

What were some of the pedagogical strategies teacher found useful? We list, in no particular order, some of the activities that our 17 teachers listed for us through interviews:

- Worksheets
- Computer lab
- Jigsaws
- Mathscape activities, like walking along the coordinate grid  
(though others did not like Mathscape as it was written for younger students)

- Seating more engaged students in front of class and then those in back of class will want to get more involved
- Board work  
(one teacher especially liked a whiteboard exercise learned at OMS professional development)
- Using manipulatives (though some teachers did not use manipulatives)
- Small group work
- Approaching issues from multiple perspectives
- Looking at both algebraic and geometric representations
- Extended response writing
- Drill exercises and contests with teams
- Do something different every class
- Quiz
- Play a game, like Jeopardy  
(having 90 minutes allows the opportunity to get into something more involved like this)

One first-year teacher teaching TPA offered these thoughts about what worked for him.

I have probably 3 or 4 things that I like that work ok. Now the problem is, if I'm teaching next year: I'll have those 3 or 4 things and I can try out 3 or 4 more other things. But my first year teaching it, I don't feel comfortable doing something I've never done before everyday. And if they have new teachers coming in to teach TPA, they are going to have them doing something new that they have never done before everyday. And it's not easy. This is my fear with TPA. They give it to the new teachers every year.

Teachers at one school agreed as a group that what did not work well with TPA students was assigning homework. Very few of their students would complete homework.

Teachers explained in some cases that they needed more resources in order to do the types of activities they thought would make the 90 minutes most productive. For example, they suggested it would be helpful to have more access to computer labs or computers in the classroom, classroom sets of graphing calculators and a classroom overhead projector that connected to the calculators. In one school, teachers even reported they needed to have access to the Mathscape books which they were not able to keep in their rooms and had to be checked out from the reading coordinator of the school—who had limited hours for when they could check the books out.

Finally, class size was mentioned by many teachers as related to how well the class went. At one school, the TPA course was capped at 24 students maximum. This is in sharp contrast to other schools where class sizes exceeded 30.

### Discussion Questions

Is there a relationship between class size and student achievement in TPA?

What is the plan for revisiting the TPA curriculum guides and revising so to provide better support and guidance to teachers as they deal with the special challenge of engaging students during a 90 minute period?

### Supporting special education students in TPA

The relationship between special education and TPA varied across the high schools visited for this evaluation study. We examined special education in TPA classes in terms of the population of students with special needs, the presence of special education co-teachers, the degree of teachers' special education training and the level of differentiation with which teachers instruct students. Each of the schools studied, with the exception of one school, included students with special needs in their TPA classrooms.

Schools varied in terms of whether TPA classrooms were assigned special education co-teachers. In the five schools with special needs students included in their TPA classes, three of them reported using special education co-teachers in their TPA classrooms while the other two stated that they did not include special education co-teachers in their classrooms. The amount of support that special education co-teachers were able to provide even when they were in TPA courses was variable. For example, in one classroom, the TPA teacher started the year with over 30 students and about one half of them with IEPs. She taught this group alone until November and at that time received help from a substitute teacher who was not trained in special education. It was not until January that she was assigned a special education co-teacher. When she talked with evaluators in May, she was very pleased with the situation in her

class because it was co-taught by her, the special education teacher and the long-term substitute. The special education teacher, while not certified in math, had a strong math background.

Teachers noted that they received general training on special education as CPS teachers. Some had or were currently in graduate courses that taught about working with special needs students. However, most teachers could not recall having received any training on implementing the TPA curriculum during the 90 minute course in relation to students with special needs. Teachers at one of these schools stated that it would have been helpful to participate in a training that addressed the interface between special education and TPA. Specifically, these teachers noted that the TPA anchor problems should be more appropriate for students with special needs.<sup>6</sup>

However, other teachers did recount that they received some information about working with special needs students when they went to the TPA professional development workshops. But there was also some confusion among teachers about when/where they received this kind of training. One chairperson explained that he did not have any special education training about TPA with OMS but then reconsidered.

Um, wait, I may be lying. Maybe we had a session.

The degree and determination of differentiation used in TPA classrooms for students with special needs varied. Teachers reported using different kinds of differentiation for students with special needs in their TPA classrooms. Teachers at one school using extended test-taking time for all of their students whereas another school said they simply follow the IEP. One school stated they grouped their students according to high-low ability groupings whereas another school reported that they simply enlarged the text for one student.

### Discussion Questions

What is the content of training within TPA professional development around special education? How can it be improved, expanded, or enhanced?

How can training regarding serving special education students in TPS be shared more widely with TPA teachers?

How can the Office of Math and Science and the Office of Specialized Services collaborate further around serving students in the Two-period Algebra course?

### Experiencing district and Area support services

We report on how TPA teachers experienced professional development provided to them by the district; the nature of the assistance that department chairs and teachers received from an OMS Facilitator and/or Area Coach; and how teachers used various mechanisms to support/collaborate with each other to overcome obstacles to implementation.

**Professional development.** TPA teachers at the six schools sampled reported mixed attendance patterns and experiences with professional development (PD) provided to them by the district. Interviewed teachers attended professional development, however, specifically who attended and for how many sessions was not clear. For example, the department chair at one school said that all the teachers attended training but not all teachers attended each of the training sessions available. A department chair at a different school said that teachers were not attending because they were not well informed about the offerings and so PD was not taken seriously. This individual also stated that even if teachers knew more about what was being offered they still might not go because they were not paid enough for their attendance. Yet at this school, some teachers said they had attended professional development.

Some teachers who attended were not satisfied with the workshops. This was reflected in the comments by faculty at two different schools. Two schools noted that PD was not geared to “lower level” students or how to work with special education students was not thoroughly discussed. Similarly, the department chair at a different school stated that PD did not address teacher needs. Teachers at this school also did not like having to pretend they were classroom students when they attended PD.

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<sup>6</sup> The obstacle of training that does not effectively address special education is apparent not only in TPA but also in the elementary schools using the CMSI curricula (see Burke, April 2006, Special Education Databrief by PRAIRIE to OMS).

The story of TPA professional development did have positive elements. Teachers at most schools reported that PD was helpful because teachers learned they were not alone in experiencing the difficulties they were facing. According to several new teachers, the sessions provided teachers with the opportunity to learn from other practitioners. In addition, one teacher helped to co-teach TPA PD sessions for OMS. Although teachers stated they went to PD, some teachers could not give examples of the content of the offerings. Yet other teachers described and credited specific activities that they learned at PD that they now carry out with their students. Thus, lessons learned from this sample of teachers indicate that the number of teachers attending TPA PD, the number of sessions attended, and the content of those sessions resulted in mixed perceptions as to the usefulness of TPA PD.

**OMS and Area instructional leader support.** Math faculty at three out of six schools indicated that they received some assistance from both an OMS Facilitator and Area Math Coach. Personnel at the other three schools identified either an OMS Facilitator or Area Coach as providing them with some support. Although interviews indicated that, an OMS Facilitator and/or Area Coach visited all six schools not all teachers working with TPA had contact with the support staff when they arrived at the school. For example, all math faculty at two schools met with the OMS Facilitator and Area Coach at school-level meetings. At another school, the TPA teachers all met with the Area Coach, but only early in the year. All teachers meeting with these support staff was not the experience at the other three schools. Only one teacher from each of these three schools reported meeting any support staff from outside the school. Of these three schools, a teacher at one of the schools said that an OMS Facilitator and the Area Math Coach met with the faculty, yet, the department chair and other teachers claim they did not receive any support from OMS. The other two schools that had either an OMS Facilitator or Area Coach visit the school reported that only one teacher at each school had contact with the support person. Thus, while all six schools reported having some contact with an OMS Facilitator and/or Area Coach, not every math teacher at the schools received support from these individuals.

To prepare the faculty for the special challenges of TPA the OMS staff and Area Math Coaches provided the teachers with various forms of support. At two schools the OMS Facilitator and Area Coach met at the school with teachers during math meetings. One of these schools also reported being given a TPA Curriculum Framework Guide and assistance with anchor problems. Contact with three schools consisted of only one teacher from each of the schools having one-on-one contacts with an outside staff from OMS or the Area. Here is the nature of the support at the three schools: 1) one teacher received pedagogical suggestions from both the OMS Facilitator and Area Coach on the content of TPA; 2) an OMS Facilitator met in a teacher's classroom and gave this person some general feedback; and 3) a teacher had a brief encounter with the Area Coach as this individual observed the teacher for five minutes on a Walkthrough. Thus, while all the schools received some support from the OMS Facilitator and/or Area Math Coach, the content of the support was not consistent within or among the schools.

**School peer support.** Teachers found ways to support/collaborate with each other to overcome obstacles to implementation but no one mechanism was reported at all the schools. Peer coaching was used at two schools; however, at one of these schools the reading coordinator provided the support to the math teacher. While two other schools reported teachers co-planning lessons, one of these schools indicated that this had been difficult to achieve at a greater level because not all teachers had common planning times. Two schools reported teachers talked informally to each other as a way to support TPA. Co-teaching was not being carried out in the sampled schools as a method used to support teachers with their instruction. However, in a focus group at one of the schools, the teachers spoke about how they learned that this was used in other schools—and how much they would like to have two teachers co-teaching TPA at their school. Thus, while teachers have found various ways to support each other with TPA instruction, no one method was used at all the schools.

**Principal and department chairperson support.** Principals and department chairpersons were not mentioned as providing support specific to TPA. The department chairpersons rarely (only one in the six we interviewed) had ever taught double period algebra. The principal was not monitoring the teaching of TPA in specific ways. At one school, a teacher remarked that her TPA course was “observed” officially but that this observation was only 5 minutes long and the extent of the principal's comments were that the teaching was “very good.” She did not find this a very helpful support.

Ultimately, teachers received support through TPA professional development, OMS Facilitators and Area Math Coaches, and from each other. These support services come in various forms such as learning new content and sharing ideas and difficulties with others at TPA PD, providing feedback on lessons and receiving TPA materials from outside support, and collaborating with each other through peer coaching or co-planning lessons within the school building. Yet, teachers expressed a need for more consistent support particularly in their schools and classrooms.

## Discussion Questions

How do OMS and Area staff members assess the needs of TPA teachers and what capacity do they have to assist them? Are there enough human resources to provide meaningful assistance to teachers, particularly first-year teachers, in their TPA classroom environments?

How can teachers receive more consistent support at both the district and area levels?

What communication exists between PD developers and teachers so that offerings reflect teachers' needs?

What supports are needed at the high schools so that TPA teachers have common of times to meet?

## Conclusions

What are the lessons learned from this analysis? How can the stories of these 6 schools inform CPS decisions around the shaping of teachers experiences in Two-period Algebra and the fostering of positive student experience and success in TPA and future academic work?

Most importantly, we encourage dialogue around the Discussion Questions we pose above. Staff from the district (Office of Math and Science, Office of High School Programs, Office of Specialized Services), the Areas and the high schools should be engaged in talking through these issues and devising collaborative actions to improve the opportunities the students targeted for TPA have to succeed in algebra.

We recognize that there are logical suggestions that can be made based on our findings that CPS can consider. For example, when

- Students are placed in TPA: A more systematic process for placing borderline students is enforced.
- Teachers teach TPA: Incentives are provided so more experienced teachers volunteer for TPA.
- Teachers use the 90 minutes of TPA class time: Class sizes are decreased and additional resources and suggested activities are available to engage students.
- Special education students are supported in TPA: TPA teachers and special education co-teachers are given tailored resources and training for TPA.
- Teachers experience district and Area support services: Teachers receive additional coaching on teaching TPA in their own classrooms.

However, these suggestions are oversimplified and need to be considered in their realistically complex context by the district, Area, and school staff involved so to make actionable plans that consider the variability across schools and the limited resources available.

Further, these findings suggest important issues regarding teacher attitudes toward students and issues of how the district structures teachers' work environments that need attention. These are issues bigger than just TPA. However TPA offers a window into these critical educational situations.

The focus by some TPA teachers on how students lack motivation and skills is troubling. The real issue is how to share with these teacher additional methods by which they can motivate students. The teachers also need to better understand that it is possible to teach algebra to students who do not yet have strong basic skills in arithmetic. Nationally there have been many groups developing useful techniques and activities to help teachers do this. There is research that documents that students, like CPS TPA students, can and do find success in learning algebra. In fact, the design of TPA is based on this research. We recognize that the TPA professional development works to address these issues. However, there likely should be additional methods and conduits to promote these messages and ideas to CPS teachers. Providing teachers with the means to be able to motivate the students effectively, to teach concepts effectively, should make it possible to have teachers in the classrooms who have positive, "my students can do this" attitudes.

The assignment of first-year teachers to the TPA course highlights a problem. These new teachers are the most vulnerable to discouragement and most lacking in tried-and-true methods for motivating students and, yet, they are the ones put in a situation where the odds are against them. A school and department's process for staffing courses is very individual to the school. However, we wonder if there are data that CPS can share on ways that schools can be more or less successful in serving students dependent on how they choose to staff courses.