

**CMSI University-based Programs:
Role and Impact of Teacher Associates**

Interim Report

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

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Introduction

This is a data brief in a series of external evaluation studies being conducted over the 2008-2009 school year by the PRAIRIE group, in order to examine the systemic educational reform underway as part of the Chicago Math and Science Initiative (CMSI) supported by the CPS Office of Math and Science (OMS). The aim of these studies is to provide OMS and other key stakeholders with a deep, nuanced understanding of the processes and outcomes of the CMSI. These studies build upon the PRAIRIE Group's external evaluation of various facets of the CMSI from 2003 to 2008.² As with past evaluations, the 2008-2009 evaluation studies are based on rigorous data collection and analysis that are conducted in such a way as to provide timely and useful feedback to the audiences including the leadership team of the OMS, the Chief Educational Officer of CPS, and the CPS Department of Program Evaluation, as decisions are made about the allocation of resources in the effort to continually improve math and science teaching and learning.

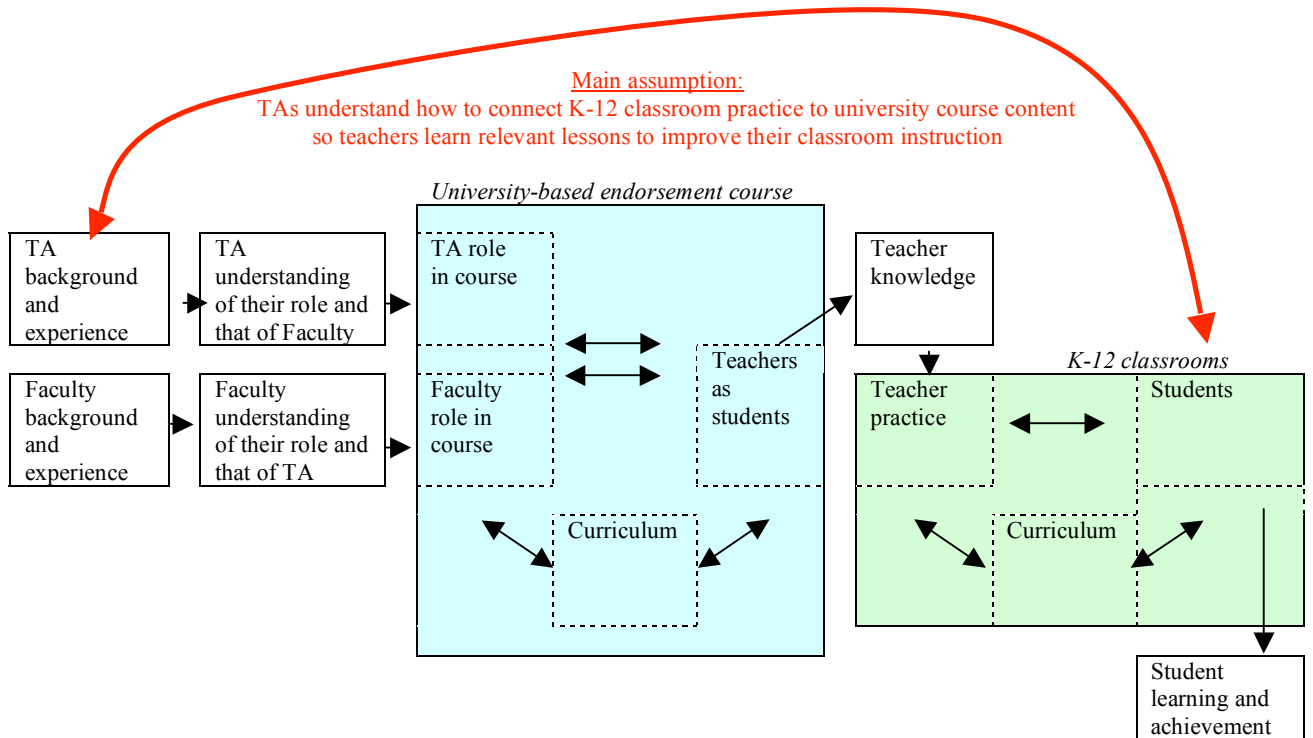
One such effort is OMS' offer of university-based credentialing programs to CPS teachers of math and science. In 2008-2009 OMS provided universities with "Teacher Associates" (TAs) to help connect university course content to classroom-level instructional practice. Implicit in OMS' support of the TA role is a program theory that the combined knowledge and skills of the faculty and TA would yield a stronger impact

¹ Authors produced this report collaboratively. They share responsibility for its contents. 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. For further information, please contact Stacy Wenzel at swenzel@luc.edu or (773) 508-7330.

² The numerous reports of findings from this external evaluation are available on the CPS Department of Program Evaluation websites at <https://research.cps.k12.il.us/resweb/pe>, and <http://www.prairiegroup.org/evaluationreports.html>.

toward high quality instruction of math and science in the teachers' classrooms. The logic of this theory would resemble Figure 1.

Figure 1: Program Theory of Teacher Associate influence on university-based endorsement courses and impact on teachers in the courses



This data brief addresses the following key questions:

1. What is the role of the Teacher Associate in the university-based endorsement course, as described by The Teacher Associates?
 - a. What facets of their backgrounds, negotiations with faculty, and the curriculum of the course itself shape their role?
 - b. What activities do they carry out in service of the course, in relationship to the faculty instructor, the curriculum, and the teachers who are students?

2. What, as described by the Teachers Associates, is the intended influence of the Teacher Associate role on the following:
 - a. Teachers in the course
 - b. Themselves as the TAs
 - c. University faculty

This data brief builds on previous evaluation reports by The PRAIRIE Group including a September 29, 2008 End of Year Evaluation Report that addressed teacher experiences in CMSI-supported math and science courses at five universities.

Methods

Data for the current brief are drawn from interviews with five TAs working in six CMSI-supported courses at three universities, between Summer 2008 and Spring 2009. (See Appendix, Interview Protocol). These include two science courses, two math courses, and two Algebra Initiative courses. All the courses could lead to teacher endorsement; and are also part of a master's degree program should teachers wish to continue. No names are used and identifying information has been changed to keep the TAs and faculty involved in this study anonymous.

These data are part of an ongoing formative evaluation that will include a survey of university faculty members teaching CMSI district-supported courses. Surveys will be conducted in the remainder of the year and incorporated into a final report.

Findings

The five Teacher Associates interviewed were consistent in their descriptions of how OMS explained their roles: to connect university course content to classroom instruction, and make that content relevant to teachers' work. The TAs found different ways to make such connections, depending on the specific course and the faculty member with whom they partnered. We describe some of the factors shaping their role and the activities they carried out in class. Then we report on how TAs explained in more detail how their role was intended to influence teachers, faculty, courses and themselves.

1. Role of the Teacher Associate

Factors shaping their role. The five TAs interviewed had all had been teachers or were currently teaching, using CMSI district-supported math and science curricula, or similar curricula. In addition to their role as Teacher Associates, all concurrently worked for the district as leaders in the reform initiative. Two were 8th grade algebra coaches serving many schools; one was a freed math and science specialist based in her³ home school, one had been a city-wide math and science specialist working in four schools, one was an OMS facilitator, and one was a professional development leader for Connected Math. All were very familiar with CMSI curricula and experienced in providing professional development to teachers.

TAs reported learning of the new Teacher Associate position through either a university math or science faculty member or from communication with the Office of Math and Science. One indicated that a faculty member with whom she had studied asked her to apply. Another cited an e-blast from OMS. A third thought that professional development leaders on the district-supported Connected Mathematics curriculum were used as a pool to draw from for TAs; while another said it was a new program "OMS was talking about."

³ In order to protect anonymity of the participants, we are using the feminine pronoun throughout the report.

After learning about the available position, they applied and were selected by OMS and their faculty member through an application process. There were differences in how much knowledge individual TAs had of the TA program. One said she did not know what the original intent was, although the position description was “on paper;” a second TA similarly referred to the description in the application. This TA also mentioned the opportunity to list preferences for the faculty members they would like to work with. A third indicated that she did not know the other TAs; in fact she did not know that others existed.

There were often connections between the TAs and their faculty member prior to their work together. Two TAs previously knew the faculty member with whom they would work, and two knew other university professors who had taught the same course.

In all but one of the courses, the TA had previously taken the same course at the same university or a similar course at another university. Only one TA had taken the same course with the same partner faculty member.

Faculty expectations for teachers helped determine how the role of the TA was structured. The faculty members had set up courses that asked the teachers enrolled to engage in a variety of activities. In differing ways, teachers were required to participate in courses through:

- Attendance
- Projects and homework
- Class discussion
- Online communication
- Journaling and “explanation” writing
- Tests and quizzes
- Research paper
- Labs and hands-on activities
- Creation of lesson plans

The elements common to at least four of the six classes were labs and hands-on activities; class discussion; projects and homework; and creation of lesson plans. Common to at least three were a research paper and tests and quizzes.

In three of the courses it was made clear that teachers were expected to work to meet specific requirements to earn a grade that would be assigned by the faculty member. For example, for one of the courses a rubric was used by teachers to self-assess and then also used by the faculty member to assign grades. However in other courses there were only pass-fail grades or, in one, the faculty member suggested to teachers that as long as they turned in the main assignment they would receive an A.

Planning with faculty partners. Prior to the start of the courses, TAs for five of them met with either the faculty member with whom they would be working or a group of

faculty members. In three of these meetings the role of the TA was discussed and decided on by the TA and faculty member together, including:

- Who would create and grade labs, activities, homework, and quizzes
- Who would lead large and small group discussions
- Who would facilitate activities
- Amount of class time to be devoted to modeling instruction, discussing student work and teaching strategies, and/or connecting content to CMSI curricula

The fourth TA indicated that her meeting did not result in a formal or detailed role description for her; rather, it focused on planning the first class session. The role here developed “organically” as the TA took the initiative to make the faculty member aware of experiences or materials she could contribute to the class.

Syllabi were made available to TAs prior to the start of the course by either the faculty member or OMS staff.

Once the courses were in session, TAs for five of them reported planning with faculty members in an ongoing way between classes -- in person, by phone, or by email. Time devoted to ongoing planning ranged from a few minutes to a scheduled hour before each class. The contents of these contacts may be summarized as including consideration of teachers’ comprehension of a topic or more generally “how they’re doing,” and decisions about alternative ways to present a topic and/or activities to link the topic to CMSI curricula.

In half the courses the faculty member and TA made decisions and adjusted instruction in each class without pre-planning, depending on how teachers were responding during class. For example, the faculty member and TA might brainstorm on assignments, with the TA suggesting problems that would be added to the homework. Or extra time in class might be taken to address misconceptions about content (held by either the teachers or these teachers’ K-12 students) through modeling, discussion, or analysis of student work.

In one case the TA and faculty met after the course to debrief and plan for the next one.

Activities carried out by Teacher Associates. The TA role was carried out with many similarities but some differences across the six courses sampled.

In all but one of the courses, TAs fielded questions from and offered information to teachers in collaboration with the faculty instructor. This interaction between TAs and teachers happened both during whole class discussion and as teachers worked in small groups or independently, with TAs and faculty circulating around the room. The TAs typically spoke about this work as something that happened with the approval of and in coordination with the faculty instructor. Some TAs had formal segments of time when they took charge of presenting material. One explained that when the faculty instructor was busy with a small group, other teachers came to her to ask questions. She also noted that during the lecture part of the course, the “professor was really happy to let me

interject.” The TA and faculty member were comfortable with this more informal give and take during the class period.

However, this same TA and two of the others explained to the evaluators that they were careful not to “step on the faculty instructor’s toes.” For three of the six courses, the TAs were very clear that the faculty member told them what to do in the course. While following explicit direction from faculty members, these TAs were also able to share their own knowledge and experiences, in either a discrete block of time or along with the faculty member throughout the class.

In the other three courses, the TAs talked about their work as “co-teachers.” One of the science and one of the math TAs said that they were a full partner in the course instruction. They shared the presenting and the leading of discussions. One noted that OMS staff had made it clear that they were not to be a “teaching assistant.” Another described how one of every three hours of the class was hers to teach solo.

All of the TAs working in science courses led laboratory activities. One explained how she set up equipment for the labs and was also in charge of grading lab reports. Four TAs had no role in assessing teachers’ performance in the course. None expressed a desire to be more involved in teacher assessment.

All TAs reported contributing to course design and delivery in the following ways.

- Creating activities that were complementary to the content being taught
- Creating or modifying labs or activities to give teachers the kinds of experiences their students would have with CMSI materials

For example, one TA mapped out activities for the duration of the course correlating content and CMSI curricula in each class session; another made analyzing student work and misconceptions a regular part of each class. Two cited the role of their experience as both teachers and professional development leaders in shaping the course, given their knowledge of what teachers were facing and what kinds of questions would come up. In another course, the faculty member considered replacing a final exam with a lesson plan project, as suggested by the TA.

In at least three of the courses, TAs said they made themselves available to teachers outside of class time. They used email to communicate with teachers between classes so they could answer questions about content or homework, help teachers prepare for exams, suggest paper topics, or direct teachers to other resources.

2. Intended Impact of the Teacher Associate

As we noted, all of the TAs shared an understanding that OMS expected them to help teachers in the university courses translate the math and science content learned into activities they would use in their K-12 classrooms. The TAs spoke at length about how

they helped teachers; all felt teachers in the university courses benefited from their work. The TA's descriptions of how they aimed to contribute are outlined below.

In this study, we have no direct measure of if and how the TAs influenced teachers. However, we find the desired influences as stated to be useful in that they shed light on TAs' view of their roles, contributing to our understanding if we are to later examine the effectiveness of TAs in the university courses for teachers.

Influencing teachers. Important themes arose as TAs described their goals and activities in the six different university courses. In all six courses TAs worked to help teachers better understand:

- Misconceptions about math and science that K-12 students (and the teachers as learners) were likely to have
- Lesson planning and instructional strategies and specific activities to use in their own classrooms when conveying some of the content they were learning
- How to use specific CMSI district-supported curricula that their schools may be requiring them to use
- How to feel more comfortable as math and science learners even when they were having trouble with difficult content and/or with juggling classes with their job and family responsibilities.

Several of the TAs mentioned that in their courses there was a high degree of variation among teachers in terms of level of content knowledge and grade taught. For example, in one course there was a range from kindergarten to high school chemistry teachers. Another course included several ESL and special education teachers. In this context, the TAs felt that their experience as teachers made it easier for them than for faculty members to differentiate instruction to adjust for teachers' backgrounds and for the grade-specific issues their students would have. For example, for two of the courses the TAs explained that they took between 15 and 30 minutes in each class to talk about student work samples that they analyzed in class for misconceptions, or to model the teaching of a specific lesson as it would be taught to middle grade students.

All TAs used their university classroom activities to foster additional teacher learning around how to plan strong math or science lessons, and to offer possible activities that they could transport for their K-12 classrooms. For example, in one of the courses, the TA described her work in supporting teachers in their assignment to develop a lesson plan, providing them with hands-on activities to try in class, and talking with them about how they could assess their students' knowledge of some of the topics they were covering. Another cited the positive feedback she got from teachers about the practical applications she provided in the course; teachers might say, "My students did this," and the TA could suggest "then you might want to think about..."

All of the TAs spoke of seeing themselves as a resource to teachers in terms of offering advice on how to use CMSI district-supported curricular materials and how to access resources available from the OMS. The extent to which this was part of their role varied.

One TA created extensive hand-out materials for teachers in her course that referenced how course content linked with specific middle grades curriculum topics that teachers would be using with their own students. Another TA talked with teachers in her course about one of the CMSI curricula, how teachers could find things in those resource materials and how, in the TA's experience, students were likely to respond. Two TAs stressed their role in informing teachers about CPS policies with regard to support for professional development and university programs leading to endorsements and 8th grade Algebra certification. They also let teachers know about professional development opportunities at museums and other institutions, and ways to obtain additional resources for their classrooms.

Finally, the emotional support that TAs offered to some teachers was reported as an important part of their role. One of the TAs said that teachers found value in "knowing there was somebody, besides the professor, [they] can talk to. Who isn't going to be assessing [their performance in the course]." Two TAs elaborated on the challenges faced by teachers in their courses. One referred to changes in elementary schools since these teachers began their careers, such as departmentalization and requirements for higher-level math and science knowledge. She felt the teachers needed support from someone who was knowledgeable in the content areas, *and* who had worked in schools, to give them the confidence and encouragement they needed to successfully complete the course. Another said that while the course content might not be intuitive for everyone, the connections she was able to make were useful to teachers; she found that as the comfort level with more advanced topics decreased, practical support became more important.

Influencing TAs. All the TAs spoke about how they benefited from their experience as a TA. Nothing negative was said. The bulk of the comments had to do with increasing their own effectiveness in their professional development roles (as coaches, coordinators, and specialists), having opportunities to share information and network across the city, and personal satisfaction. Representative comments are indicated below.

Two-way feedback. One TA described bringing ideas from the teachers in her course to the professional development work she did with teachers in her school, and vice versa. Another said that getting other teachers' perspectives on students' work that she brought to the university course gave her a deeper understanding of her students' knowledge and helped her be a better teacher.

Connecting to the classroom. A TA who was no longer in the classroom felt that being connected with classroom teachers on such a practical level helped keep her "grounded," providing her with "conversations with real teachers that are doing the things we are talking about."

Understanding and using CMSI curricula. Another TA said the experience gave her a deeper understanding of the curriculum, and illuminated content knowledge deficiencies for some teachers. This was helping her to better plan for her work with teachers next year, getting her "to look deeply into the curriculum and to look ahead."

Similarly, another TA valued the opportunity to experience different perspectives on ways of working with the content and CMSI curricula.

Co-teaching teachers. Getting experience co-teaching teachers – which she noted was different from working with students – was cited by one TA as a benefit to her professional development role.

Networking and information-sharing. One TA felt the opportunity to make professional connections would advance her career; several others spoke of the benefits to their professional development or classroom work resulting from being able to meet and exchange information with teachers from all over the city.

Satisfaction. For one TA the greatest benefit was contributing to improvement in the teachers' comfort level with the content area. Another was pleased to be able to help different people in different schools make decisions such as choice of a CMSI curriculum, and, through connecting teachers with resources they had not known about before, helping to create better classrooms.

Influencing the courses and the faculty. All the TAs felt the course was enhanced by their participation. One TA expected that debriefing after the course would help the faculty member approach the next course with a focus different from simply transmitting content knowledge. One reported the faculty member with whom she worked believed the TA's rapport with the students would improve the course. Another TA thought the course was improved by being kept "real and practical." Others stressed the increased capacity to relate to CPS teachers and CPS issues. While all noted the importance of making the course more relevant by connecting content to curriculum -- with one describing that element as invaluable—none suggested any long-term influences on faculty outside the context of the specific course.

Questions for Reflection

1. To what degree has implementation of the Teacher Associate program met OMS expectations?
2. To what degree has implementation of the Teacher Associate program met university faculty expectations?
3. Based on insights offered by this year's TAs, how might the program be improved? How might courses with TAs be improved? How might courses without TAs be improved?
4. Should the number of university-based credentialing courses taught with a TA increase? If so, how should faculty members and TA candidates be recruited?
5. How might communication among TAs, faculty members, and OMS be structured to maximize teacher learning in university courses?

APPENDIX

Teacher Associate Interview

Teacher associate role:

1. In general how would you describe your role?
2. Do you think the university instructor you work with perceives your role in the same way?
3. In what ways do you work with the university instructor?
 - a. Are your roles clearly defined and agreed upon by both you and the university instructor?
 - b. What duties do you assume and what duties does the university instructor assume?
 - c. How did you determine who would assume each role?
4. In what ways do you work with the teachers (students) in your class?

Benefits and impact of teacher associate role:

5. What benefits do you expect to gain through this work?
6. Are there benefits that may impact your own teaching?
 - a. Your school?
 - b. Your students?
7. In what ways do you perceive the teacher associate role as enhancing the course?
 - a. If so, in what ways?
 - b. Probe on whether they think relevance is enhanced.