

Buffalo Public Schools

A collaboration between Math Solutions Professional Development and Buffalo Public Schools to improve mathematics instruction is in its seventh year. Early on, teacher leadership at the school level became a central aspect in the professional learning program. Partway through the process, the implementation of the newly adopted curriculums, *Investigations and Connected Mathematics*, emerged as another focus for the program. We first profiled Buffalo's progress in 2005, and this article takes a look at the steps the district has taken since then with the help of Math Solutions.

Snapshot of the Past

As one of the five largest districts in New York State, Buffalo's 70 schools serve a diverse student population of nearly 40,000. In 2000, Buffalo Public Schools and Math Solutions launched an initiative for instructional improvement in the K–8 mathematics program. From the beginning, Debra Sykes, Director of Mathematics, and Arlene Rosowski, Supervisor for Elementary Mathematics, had a strong vision for mathematics instruction—"to create mathematically powerful students who communicate about the mathematics they learn, who justify their thinking, and who work with others or alone to solve problems."

In the early stages of the partnership, this vision was new for many teachers and very different from their own experiences in teaching and in learning. To address the challenges teachers faced, Buffalo education leaders and Math Solutions designed an ongoing array of professional development experiences for Buffalo teachers, all with common characteristics. Every session and course helped teachers build their own mathematical understanding, understand how children learn, and strengthen their instructional practices. Professional development available during the school year and the summer included the following:

- Math Leadership Teams—year-round series
- Five-day Courses for teachers

- School-Based Coaches (Building Mathematics Teachers)—year-round series
- Supporting District Math Adoption—year-round series
- Supporting District Math Adoption—school-based year-round series

During the course of this initiative for instructional improvement, Buffalo Public Schools turned to teachers for additional leadership support. At the same time, new mathematics curriculums were adopted to help teachers foster the development of mathematical power for all students. These factors caused a shift in the nature and focus of the professional development. This report highlights recent work in Buffalo, centered on curriculum-based and school-based professional development.

Curriculum-Based Professional Development

Initial experiences for teachers in Buffalo addressed the use of mathematics tasks that called for thinking, reasoning, and solving problems. The challenge for teachers was finding and using similar tasks that would help them provide a comprehensive math program for students. With the adoption and implementation of *Investigations and Connected Mathematics* (funded by the National Science Foundation), two curriculum projects rich in worthwhile tasks, the challenge was solved. And with that solution came the opportunity for Math Solutions to build professional development experiences for Buffalo teachers that addressed math content, how children learn, and instructional strategies all in the context of learning about and implementing these new curriculums.

Crucial to the successful implementation of both curriculums is teachers' knowledge of the mathematics content in the material and of good instructional practices. By weaving the curriculums throughout the professional development designed for Buffalo,

Math Solutions helped build teachers' knowledge base so that they could use the curriculums more effectively. Jean Milkie and Jodi Baden, building mathematics teachers, acknowledged the impact curriculum-based professional development has had on their own practice and on the teachers whom they support. Each of these leaders gave firsthand accounts of new directions in Buffalo's mathematics professional development that are increasing teachers' confidence and are grounded in their everyday activities of teaching and implementing the new curriculums. In the next section, Jean, Jodi, and their colleagues talk about their role as leaders and the experiences that have helped them and their teachers.

Supporting Teacher Leadership Through School-Based Professional Development

Teacher leadership is a long-standing component of Buffalo's plan for supporting strong mathematics instructional programs in schools. Building mathematics teachers and lead teachers provide direction and support to teachers in many ways—planning lessons, modeling instructional practices, coteaching math lessons, aligning instruction with the standards students are expected to learn, and sharing wisdom and expertise. While this list is only the tip of the iceberg, it represents the nature of teachers' work and a direction and focus for supporting them—school-based professional development.

Over the course of the school year, teacher leaders meet with colleagues from other schools and Math Solutions Education Specialists. They meet in schools for sessions designed to help them support their colleagues in effectively teaching the adopted curriculum. While these experiences share characteristics of the professional development mentioned earlier, they also help participants appreciate and analyze the work of teaching. (See right side.)

School-Based professional development for building math teachers and teacher leaders is designed so that:

- Student learning is the overarching goal.
- Lessons with students in the hosting schools provide the context for teacher learning.
- The activities of teaching—planning, implementing, reflecting on, and improving lessons—are the focus for the work.
- The development of teachers' mathematics content knowledge is crucial and linked to the content and process standards for student learning.
- The pedagogy of good instruction is modeled, discussed, and analyzed.
- Implementation of the adopted curriculum provides the instructional context.

Central to this year's work with building math teachers and lead teachers have been lessons with students in the hosting schools. Planning, observing, and discussing lessons taught by a Math Solutions Education Specialist makes explicit the instructional approaches teachers can use to successfully implement *Investigations* and *Connected Mathematics*. Responses from these leaders highlight the impact of this approach. Jodi Baden said, "These lessons have been really helpful. Observing the Math Solutions Education Specialist doing a lesson with our students gives me an opportunity to reflect on how I make connections to the curriculum in my own practice."

Other building math teachers shared similar responses:

"As a result of my work with Math Solutions, I feel more comfortable teaching each *Connected Mathematics* lesson. The classroom lessons have been especially helpful to me.

When I reflect on my classroom teaching and what I've learned, I realize how important it is to know

that students need time to investigate, play, explore, and practice ideas to be sure they understand. I think it's so important to have the students explain their answers both orally and in writing."

While leaders easily see the impact on their own learning, the most important effect of this professional development program is the transfer of learning to the teachers in their schools.

Jodi explained the "snowball" effect of implementing new practices:

Incorporating lesson planning into the professional development we're receiving has impacted me positively. Now, when I am leading a lesson, it's definitely changed for the better because of the type of preparation I'm doing. Further, because the planning has impacted me (and my lessons), I know it's impacting other teachers' practice as they observe my lessons. I can say with certainty that the Math Solutions sessions are helping me grow as a Buffalo mathematics teacher, and I think I'm helping other teachers in their practice.

Jean Milkie said she's seen increased enthusiasm among teachers. "I see more excitement; teachers approach me and say, 'Look what I did!' The curriculum we're using is so much more stimulating than the traditional curriculum. I've never seen this level of animation."

Final Reflections and Next Steps

Jean, Jodi, and the other building mathematics teachers feel strongly that the changes they've seen in their

schools have come about with support from many levels. Jodi commented, "Our principal and assistant principal share our goals. They understand the curriculum and what it takes to teach it well. We're currently providing 60 minutes of uninterrupted time for mathematics instruction."

Jean added, "Our principal, too, is supportive and confident in me and in our teachers. She has welcomed the support from Math Solutions and shows interest in staying tuned in to the work we're doing. I'm feeling positive about where we've been and where we're headed. This has been a team effort, from the teachers to district mathematics leadership to Math Solutions!"

This spring, one K–4 school and two K–8 schools will receive additional support with their school-based professional development. While continuing the in-service outlined above, teachers and the mathematics leaders in these schools will have a Math Solutions Education Specialist assigned to their school to develop teachers' instructional expertise and collaborative support for improved mathematics instruction. Four questions will drive the effort in each school:

- What instructional improvement do we need to make?
- Why is it important?
- What will we do about it?
- How will we know we've been effective?

Math Solutions is eager to launch this next phase of professional development with Buffalo Public Schools. Stay tuned!