The room hummed with excitement. In one corner, a group of teachers charted strategies for fractions and decimals. On another side, a different group graphed data categories. A third group piled manipulatives into crates. The teachers previously had analyzed students’ mathematics standardized test results. Throughout the last academic year, they had met in a learning community to discuss research-based teaching methods, to plan, to encourage, and to coach one another. They had seen the results—a documented increase in achievement for students of color—and the results generated even more energy among the staff.

Brewer Elementary, where these teachers work, is in the southeastern United States, deep in an urban area of Columbus, Ga., besieged by poverty and neglect. In a community of low-rent housing, trailer parks, and apartments, about 96% of its 520 students in prekindergarten through 5th grade receive free lunch. Nine out of 10 children in the school are black. The average student mobility rate is about 30%.

Before beginning their professional learning journey, teachers had consistently struggled with students underperforming on state standardized tests.

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How one school made the pieces fit

Elementary school builds on a learning community to lift achievement for black students in reading and math
These charts show a comparison over three school years of the percentages of students scoring at the basic, proficient, and advanced levels on the Criterion Referenced Competency Test, a Georgia standardized exam, for Brewer Elementary School black students and white students countywide. The number of white students in Brewer was too low to report scores.

The school hired a reading coach to work with teachers in grade-level team meetings and set a 2½-hour daily literacy block for all students. During this protected time, students spent one hour on reading, one on writing, and a half-hour on literacy skills. Teachers began meeting regularly in grade-level teams.

Principal Jan Grogan restructured class schedules to allow teachers to meet regularly to review student work and address the needs they saw in their classrooms. A design team of the reading coach, Grogan, and Wood met weekly with the grade-level teams.

The literacy coach created agendas for each meeting to ensure that all would stay focused on the objectives. “These times became invaluable,” Grogan noted.

The design team also began regular classroom walk-throughs, looking for artifacts as evidence of instructional changes according to the revised reading curriculum, and when essentials weren’t present, the team called teachers together to find out what additional support they needed to make changes.

Over two years of intense effort, students’ literacy was the first to improve. Teachers saw the results of their efforts.

“Students’ reading level was changing, along with their vocabulary,” said Grogan. “We gave the Developmental Reading Assessment every nine weeks, and their levels started going up from all the reading they were doing.”

In 2003, with literacy skills successfully improving, Brewer Elementary teachers began talking about a collective effort to raise student achievement in mathematics.

As a faculty, teachers developed guiding questions to address students’ low test scores in mathematics:

The teachers knew they needed to address all aspects of student learning.
# Working in concert

BREWER ELEMENTARY SCHOOL’S PROFESSIONAL DEVELOPMENT ALIGNS WITH NSDC’S STANDARDS

<table>
<thead>
<tr>
<th>NSDC STANDARD</th>
<th>STRATEGIES AT BREWER ELEMENTARY</th>
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| DATA-DRIVEN   | • The design team, along with classroom teachers, examined and analyzed standardized test data.  
• Adequate Yearly Progress goals drove changes in curriculum and instructional strategies.  
• Staff created a “war room” to keep data visible but confidential.  
• Classroom teachers analyzed students’ daily work and classroom assessments. |
| RESEARCH-BASED| • The design team investigated research-based programs that were compatible with ways that students learn.  
• Classroom teachers implemented several research-based mathematics programs; however, through informal, embedded action research, including teacher interviews, assessments of student work, and standardized test data, teachers determined that the programs were not working.  
• The design team and classroom teachers visited other schools that were making AYP. |
| QUALITY TEACHING| • A design team was formed of members from diverse backgrounds.  
• The school offered a summer workshop on conceptual understanding, and approximately 90% of teachers attended.  
• The principal restructured the teachers’ master schedule to accommodate common planning time. Grade-level meetings and common planning gave teachers time to evaluate and discuss student work and progress.  
• The design team conducted walk-throughs to offer teachers constructive feedback.  
• Academic coaches modeled lessons for classroom teachers.  
• Monthly early release days for students provided additional time for staff development on specific instructional challenges, such as teaching problem solving.  
• A math consultant from the Georgia Council of Teachers of Mathematics facilitated the transition from procedural teaching to teaching for conceptual understanding.  
• A math coach and math specialist modeled lessons for teachers.  
• The faculty began a weekly book study. |
| LEARNING COMMUNITIES| • Teachers met regularly to discuss current educational literature and topics.  
• Teachers across grade levels observed one another teaching and discussed how to implement best-practice strategies in their own classrooms.  
• Grade-level teams met using specific agendas in which items were designed to improve student achievement.  
• The design team provided leadership.  
• Teachers used informal hallway meetings to discuss student work and achievement.  
• All faculty participated in Georgia Performance Standards training.  
• School leaders posted the National Council of Teachers of Mathematics standards in all classrooms.  
• Faculty worked to align instructional goals and objectives with state assessments and national standards. |

• How can we as teachers modify our instructional practice to positively impact the achievement gap between students of color and white students?  
• What role does assessment play in increasing student achievement?  
• How can we increase our knowledge of elementary mathematics?  
• What resources are available to facilitate this inquiry?

## DEVELOPING THE PLAN

Grogan decided to use Title I money to hire a full-time math academic coach and math specialist in addition to the reading coach already on board. She shifted Title I money into hiring the new staff, rather than using it as before on aides and buying supplies that teachers designated.

“We hadn’t been focusing our spending,” Grogan said. “Once we focused what we needed for instruc-
tion, we began to make the difference.”

The math coach and specialist joined the design team to develop a quality professional development plan to improve overall teaching and learning in the school. The design team researched teachers’ professional learning and found agreement on the characteristics of effective professional development (Darling-Hammond & McLaughlin, 1995; Barth 1990; Edelfelt, 1981; Joyce & Showers, 2002; Lieberman, 1995; Guskey 1994; NSDC, 2001; Rosenholtz, 1989). Effective professional development is:

• Collaborative, involving educators sharing knowledge;
• Intentional and experiential, engaging teachers in the tasks of teaching, assessing, and observing;
• Grounded in participants’ questions and centered on inquiry;
• Connected to and derived from teachers’ work with students;
• Ongoing, sustained, and intensive, supported by modeling, coaching, and problem solving around specific problems of practice;
• A systemic process that considers change over an extended period of time; and
• Connected to other aspects of school change.

The design team’s vision was aligned with the National Staff Development Council’s (NSDC) Standards for Staff Development (see box on p. 32).

The design team researched and analyzed data. The team used a vacant classroom to set up a planning room, dubbed “the war room” by staff who saw it as the hub for battling underachievement. The members of the design team worked with classroom teachers to examine students’ standardized test scores, their practice test scores, and classroom work, then posted scores, graphs, and trends on pieces of chart paper taped to the walls for review and analysis. The space provided a confidential place for teachers to leave the records in place for constant thought and work.

Initially, teachers geared their work toward the underperforming 4th and 5th grades. Lower grades students’ mathematics scores were at acceptable levels, and teachers inferred that all was well in kindergarten through 3rd grade. But after a year of work on mathematics, students’ results still were not acceptable to the staff.

“Our scores remained low, and our students did not seem to get it no matter what we tried,” said Bonnie Harmon, a 4th-grade teacher.

Teachers went back and examined student work, conferred with students, and asked them to explain their answers on math assessments. They found that students in the upper grades were struggling due to a lack of number sense that had not been adequately developed in the lower grades. Third- through 5th-grade teachers realized that they needed to back up and help the older students develop the number sense that they had somehow missed.
The math coach and specialist realized the next step was to help teachers transition from procedural teaching to teaching for conceptual understanding in mathematics in all grades.

During the common grade-level meetings, teachers brought student work samples that represented a range of work and adopted common assessments. Teachers compared student work against state and national standards. They focused on the question, “Does this work sample meet the standard?” Teachers began to develop lessons based on student assessment results.

Small cross-grade groups of teachers gathered informally to discuss students’ progress and to discuss interventions and teaching strategies. Teachers began to pose daily problems to students, problems that required higher-level thinking skills, and encouraged students to use multiple representations to communicate math ideas and to work with each other to solve the problems as well as self-assess. As the common planning meetings continued, the design team discovered that teachers still were struggling with teaching conceptually.

The team hired a math consultant to assist in developing the faculty and the paraprofessionals’ own conceptual understanding of mathematics. Approximately 90% of the faculty and some paraprofessionals attended the first voluntary summer workshop on conceptual teaching.

The design team understood the ineffectiveness of a one-shot workshop (Guskey, 1994; Little & McLaughlin, 1993; Joyce & Showers, 2002; Guskey, 2000) and so provided ongoing, consistent support for the teachers throughout the following school year. The county schedule called for monthly early student release days, and the design team scheduled professional development on those days. The math consultant led sessions, along with members of the design team. They began with book studies, and teachers were accountable for the readings by turning in to the principal assignments answering key questions about the literature. At the meetings, teachers discussed the reading and tried new activities.

For example, Grogan said, they would talk about students’ hundreds chart (a block of squares in which students fill in numbers sequentially in rows of 10) and its importance, then brainstorm ways to use it in the classroom. The design team would ask teachers if they needed support in any areas, then would provide activities for teachers to use that would assist in instruction.

“Anything the teachers saw a need for, if they felt weak in an area, we would help,” Grogan said.

Brewer Elementary also partnered with the Columbus Regional Mathematics Collaborative, which is housed at Columbus State University. University staff provided focused math workshops based on teachers’ needs that they themselves had identified or the design team had noted in the weekly classroom walk-throughs now occurring. In addition, several times a week, the math coach and math specialist modeled lessons for teachers.

Seeing a discrepancy between the changing way of teaching and the curriculum, the design team sought a more comfortable curriculum match for teachers. Team members visited several standards-based schools throughout the state to observe different math programs, seeking a program built on conceptual understanding. In 2004, Brewer Elementary began using TERC’s Investigations in Number, Data, and Space (Scott Foresman, 2004).

All the added support began to make a difference now in math, too.

“What we began to see was that kids started having strategies for figuring out an answer,” Grogan said. “They started visualizing in their heads where the 16 was on their hundreds chart, what number came on top and below it. They were able to use conceptual thinking in answering questions, whereas before it was all just using numbers and trying to figure out ‘Do I add or subtract?’ They had steps for coming up with answers.”

“We were looking at formative data,” Wood noted, “posting that data, and teachers were tearing apart those common assessments to look at where the students were scoring the weakest. It was like all of that fit together all of a sudden. We knew where we wanted to be, what our goal was, but we saw the pieces suddenly all starting to fit together.”

As Grogan noted, “The teachers had never taught conceptually before. It wasn’t that they weren’t working hard. They were working hard; it’s just that we weren’t getting anywhere (with improving student achieve-
ment). The teachers just had to be taught how to teach conceptually.”

SUCCESS

Today, professional learning at Brewer Elementary has become an ongoing process embedded in everyday practice. Opportunities for teacher learning are connected to meaningful, authentic, and immediate problems of practice. Because teachers’ motivation to learn and to engage in school change efforts increased, Brewer Elementary was successful in its effort to begin closing the achievement gap for students of color.

Students at Brewer made Adequate Yearly Progress on state standardized tests in 2004-05 and again in 2005-06. The school now is released from the state designation of needing improvement. And students in this high-poverty, highly mobile society now have hope of achieving new levels of success.

Wood said she and a colleague had paused only recently to take stock. “We started thinking about what had changed in our school as a result of the whole reform effort,” she said. “It was an ‘aha’ moment. Teachers were so involved in their classrooms, and the design team was so involved in making sure it was supporting teachers, we didn’t realize the changes that have happened. We became a professional learning community and then realized what we had done. Our whole faculty has changed. This school is the coolest place to be! It’s cool for children, but it’s really cool for adults.”

REFERENCES


Guskey, T. (1994, Fall). The most significant advances in the field of staff development over the last 25 years. Journal of Staff Development, 15(4), 5.


