

Deer Valley (Unified School District)

Deer Valley Unified School District, located in the Phoenix metro area, serves approximately 37,000 students. Lisa Koenig, Curriculum Instruction Specialist for Math, came to Math Solutions with a vision and plan for beginning the improvement of the district's mathematics program. This report outlines aspects of that plan and the efforts initiated during this first year.

Clarifying Professional Development Needs

Lisa Koenig's 20-year history in Deer Valley Unified School District gives her a unique perspective on the needs of the math program. Her current leadership role is informed by her experience as a high school teacher and her many opportunities to observe and talk with teachers across the district about math instruction.

Lisa explained, "The curriculum instruction specialist for math is a position new to the district. Being in this role has afforded me a wonderful opportunity to have a voice in the area of mathematics." Her voice represents a wealth of expertise and insights that she gathered as a math teacher and as a district instructional leader. She approached her new position knowing math teaching needed to change.

"As a system," Lisa stated, "we narrowly focused on skills development, though implementation of problem-solving strategies has occurred in some schools and among some faculty. However, for the most part, problem solving was seen as an event rather than as a core teaching task and focus for instruction."

While Lisa is clear about the importance of developing students' math skills, she is also clear about other important aspects that need to be developed. "Skills are important, but there needs to be a balanced approach. Students require opportunities to use math in real-life situations—situations that make sense to them. They need chances to understand the mathematics they are learning and chances to use those ideas to solve problems that are meaningful to them."

Lisa's view aligns with *Arizona Academic Content Standards: Mathematics Articulated by Grade Level*, which sets the path for mathematics instruction:

The need to understand and use a variety of mathematical strategies in multiple contextual situations has never been greater. Utilization of mathematics continues to increase in all aspects of everyday life, as a part of cultural heritage, the workplace, and in the scientific and technical communities. Today's changing world will offer enhanced opportunities and options for those who thoroughly understand mathematics. (Standards Articulation by Grade Level Project 2003, viii)

This path requires a shift from a procedural view of mathematics to a view that encompasses understanding, skill development, and problem solving.

A district-wide goal in Deer Valley is to improve student learning of mathematics, which is measured by performance on the state assessment, Arizona's Instrument to Measure Standards (AIMS). Recognizing that teachers' content knowledge and instructional strategies have significant bearing on student learning and achievement, Deer Valley Unified School District places the focus for teachers' professional development on these aspects of learning.

Determining the Components of a Plan

With the aid of a Math and Science Partnership Grant, the district began to make its professional development goals a reality. With district support, Lisa developed a three-year plan that includes the following:

- Creation of a district curriculum that is a departure from the district's adopted text—with this curriculum, teachers are asking themselves how they should teach to accomplish the new objectives
- Development of quarterly K–8 benchmark assess-

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ments that will inform instructional decisions

- Collaboration with a local community college to focus a small group of teachers on specific math content areas
- Establishment of a cadre of teacher leaders for individual school campuses similar to the district's English language arts liaison model
- Math Solutions Professional Development services for classroom teachers and math teacher liaisons

The following gives an account of the collaborative efforts between Deer Valley Unified School District and Math Solutions to strengthen mathematics instruction.

Professional Development for Teachers

During the summer of 2006, teachers became actively involved in the pursuit of systemic change by participating in the district's first five-day *About Teaching Mathematics* course. Their participation gave them newfound confidence with math content, a better understanding of how children learn, and a variety of effective instructional strategies to take back to their classrooms.

Lisa is delighted and encouraged by what she has seen in schools and by what she has heard from teachers.

"The course inspired teachers' enthusiasm about math and about the prospect of kids getting excited. 'My kids are really understanding math and are more excited about math than I've ever seen' is a common refrain among teachers." Lisa went on to say, "We need kids who are comfortable with math and can take math beyond school. . . . We want them to value, understand, and feel confident with math in the long term."

"As a result of the course," Lisa reported, "teachers are developing a better understanding of the new curriculum. They are trying out instructional strategies new to them and are looking beyond their

textbook for student experiences that match the standards they are expected to teach."

Professional Development for Math Liaisons

The district's experience in building capacity for a strong literacy program confirmed that school-based leadership is a powerful way to provide teachers support as they engage in the process of shifting their instruction. Lisa built on the experiences gained in literacy to frame a model for math leadership. She worked with principals to identify teacher liaisons in their schools who would take on a new role of leadership for math.

The path to taking on a new leadership role is often challenging for teachers. To support them, Patty Clark, a Math Solutions Education Specialist, provided and facilitated regular professional development opportunities. Working together, Lisa and Patty determined experiences that helped liaisons build their instructional expertise and begin to communicate a vision for math instruction back at their schools.

Cindy Beebe, a sixth-grade teacher and Math Liaison at Village Meadows Elementary School, shared her thoughts on participating in leadership sessions. "Math Solutions has opened my eyes to so many new ways to teach math, and to make the learning engaging for my students and myself. The professional development aligns to our state math standards and supports the use of resources that are very accessible. The hands-on lessons are geared toward differentiated teaching, which allows me to better reach each of my students."

Cindy's response mirrors the experiences of other liaisons. And, while one purpose of the professional development for liaisons is to strengthen their own practice, another is to launch them into working with teachers in their schools.

Commenting on that effort, Lisa said, "We ask liaisons to communicate with colleagues in their school

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about math teaching. In this first year, we also ask them to focus on one way they will work with colleagues. For example, they might work with their own grade level to plan and try out new strategies and lessons. Or they might work with their principal to plan and facilitate an experience for their entire school faculty.”

Lisa continued, “As the liaisons receive more professional development and refine their expertise in working with teachers, they’ll be asked to do more. I see their role evolving over time.” This year, school-based follow-up experiences for liaisons have already prompted them to think differently about their role.

On-Site Follow-Up Experiences

Like student learning, teacher learning is a cycle of taking in new thinking or information, trying out new learning, reflecting on the results, and launching the cycle again. Sessions that follow up on teachers’ professional development experiences provide a perfect context for launching the learning cycle repeatedly. And what better place to follow up than in a school building? In four school-based leadership days, liaisons were able to experience firsthand the impact of professional development that is linked directly to the classroom.

Cindy, who has been involved in this on-site work, said, “Patty used two of our classes as models so we could see the lessons in action. Every student was engaged and focused. The lessons involved real-life situations; students could relate to the situations and apply the math they were learning.”

With Patty’s extensive experience as a math coach, she has been able to design and facilitate practical yet thought-provoking sessions for these math leaders.

Patty talked about the liaisons and their learning. “Observing the student lessons allows the teachers to see how to implement instructional strategies they’ve

experienced as learners. Over and over again, teachers comment on the value of this opportunity.”

Discussions with teachers about what they observed give Patty insight into next steps to take in subsequent sessions. Related to the overall focus on problem solving, Patty reported, “Teachers needed experiences with math. They needed to solve problems in groups and discover that many directions can be taken to find solutions. Talking about the classroom application of the approaches they experience helps the teachers expand and refine their vision of math and how they might teach it.”

Lisa summarized what she has seen so far in this way: “Teachers who have attended more than one of the professional development opportunities that have been offered have really gained the most. They’ve had such a wealth of enriching experiences.”

In thinking about the future, Lisa is clear. “I really believe that ongoing experiences and follow-up are key to continued growth and change,” she said.

Maintaining the Momentum of Change

“We’re offering five-day courses to teachers again this summer, and already we have a waiting list!” said Lisa.

Teachers who were not involved last summer have the opportunity to attend the foundational course, *About Teaching Mathematics, Part 1*, while returning teachers will extend their learning by attending *About Teaching Mathematics, Part 2*. Both courses expand teachers’ instructional strategies and strengthen content knowledge.

“Teachers are really good at spreading the word. ‘You have to go!’ I hear them saying to one another. There is a buzz around math that was never there before,” Lisa shared.

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Lisa is thoughtful and realistic about what she hears. “Creating a buzz in year one is OK. All the same, we can’t offer professional development once and expect to maintain the excitement. We have to bring follow-up learning experiences to many more teachers so momentum is not lost. We have to continue the experiences, year after year, in order to make system change. And my goal is a system change—a change for every child in our district.”

Cindy commented, “I feel incredibly lucky to be a part of the fire that is being lit in our math program. Students are applying what they know, not just memorizing facts only to forget them later. Math is a delightful subject for me to teach, and for my students to learn. I think Lisa’s vision and passion are carrying over to teachers and beginning to reach our students.”