



Teaching teachers, students math

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Katherine Gallegos Elementary School hosted the second annual Mathematically Connected Communities, or MC2 Math Lab last week.

The lab is a professional development program created by New Mexico State University to help teachers increase student math performance.



(Deborah Fox-News-Bulletin photo) Katherine Gallegos Elementary students work as a team to figure out how many cups of lemonade were sold to make \$0.57 during NMSU's second annual MC2 math lab. Pictured, from left, are second-grader Raymond Stafford, NMSU mathematician Tanya Rivers, Amara Montoya, Lucas Sarabia-Mendoza and Rocky Trujillo.

Children in grades 2, 3 and 5, about 69 students in 16 classrooms, were videotaped while receiving instruction from NMSU mathematicians. Teachers from around the region were streamed the video in adjacent classrooms.

About 92 teachers and academic coaches came from Los Lunas, Belen, Socorro, Jemez Valley, Vaughn and Corona school districts for the week-long professional development program.

In the morning, teachers sat at children's classroom tables in groups watching the video-taped students and sharing their analysis, insight and experience with each other.

The NMSU mathematicians modeled a new teaching method aligned with Common Core Standards that helps students develop a foundational understanding of basic math concepts.

Sara Morales, the senior program manager and researcher for the MC2 professional development program, explained that in the old model of teaching, students were usually given a worksheet with several math problems, and the teacher stood at the head of the class providing instruction and solutions.

In the new Common Core Standards based learning environments, students sit in groups to solve a math problem together as a team. They are encouraged to talk to each other about the problem and are prompted, through strategic questions from the teacher, to explain how they worked out the solution.

It's a collaboration among students and their teacher in problem solving and finding the proofs of how and why mathematics works, said the senior program manager.

"It gives them a foundation for algebraic thinking and also for problem solving in the real world," Morales said.

Two of the University's math lab facilitators, Janet Dunham, an MC2 field specialist, and Janice Bradley, a research assistant professor, said without a good math foundation, students can't build on their math knowledge.

"All the trouble we're hearing about how nobody's passing algebra one anymore, it's like, that's why, because we don't teach it well enough in (kindergarten) first and second (grades)," said Bradley.

"Teachers are learning the mathematics and they're learning the mathematics they need to teach," added Dunham. "They're deepening their content knowledge and then they're learning, if they know how kids learn the mathematics, they're also learning instructional strategies that

support kids' learning the mathematics."

MC2 is aligned with Common Core Standards, which delves deeper in one math problem at a time to build greater student understanding of math concepts.

For example, in a second-grade class, students are given a math problem using sales at a lemonade stand, where they earned 57 pennies.

"If a small cup cost 1 penny and the large cup cost 10 pennies, how many cups did you sell? How many more cups would you need to sell to make 60 pennies?" the instructions asked.

The second-graders were encouraged to work with "math tools," in this case cups and pennies, to work out the problem among themselves. NMSU mathematician Tanya Rivers guided the student's by asking targeted questions.

Filling large cups with 10 pennies each, the children discovered that five large cups of lemonade were sold and 7 pennies remained proving that seven small cups of lemonade were sold.

Rivers said the children made great progress learning as a team.

"They realized that there's not just one right answer, one right way to do anything, but all of our ideas are valid — 'My peers are listening to me,'" she said. "We had some students at the beginning of the week who did not want to say anything to anybody and then by the end of the week are really wanting to share their ideas and interact with their peers."

In any math class, there are students who have a high level of understanding all the way to students with a minimal understanding. So when all the students work together, they benefit from all the different levels of understanding because children speak to one another in the same language.

In the afternoon sessions, the teachers worked with the mathematicians to expand their content knowledge of math and to develop student lesson plans.

"The teachers learn how to ask questions so that the students come to their own understanding," says Los Lunas academic coach Venessa Tregembo. "We're really just learning how to facilitate the learning instead of standing and talking, and students listening and responding."

It's about getting interaction from everybody and places students at the center of their own learning with the teachers just facilitating knowledge.

"We're learning how to differentiate instruction for all the different levels of understanding," Tregembo said.

"There are ways that kids can explain it to kids that is beyond what teachers can even think of some times.

"The students become teachers as well, and when they come to that understanding on their own, they're just more likely to remember it because it's not a formula that they have to recall later that they haven't internalized," she continued.

The program started last summer in Las Cruces and is funded by the New Mexico Public Education Department and the federal Math and Science Partnership.

For more information about MC2 Math Lab, contact Sara Morales at smorales@nmsu.edu.

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