Math program adds up for Vermont’s teachers

BY JEFF WAKEFIELD

“Are you ready for this?” Vermont Technical College Math Professor Beth Gamble cheerfully questions a room full of elementary school teachers at Delaney Hall on the campus of the former Trinity College. “It’s algebra time again.”

In answer, an electric pencil sharpener stationed on a table near the front of the class gives a series of staccato bursts, activated by a group of particularly determined looking teachers seated around it. The class dissolves into laughter.

The can-do attitude, if not the sharp pencils, are shared by all 34 teachers in the class, part of a group of nearly 70 kindergarten-through-sixth grade instructors from all corners of the state who drove through snow and freezing rain on a recent Friday to attend a two-day session of the Vermont Math Institute.

VMI, a joint venture of UVM, the Vermont State Colleges, the Vermont Department of Education and the Vermont Institute of Math, Science and Technology, is an innovative degree program designed to improve elementary school math instruction in the state.

Participants attend two-day workshops six times during the year, complete lengthy homework assignments between sessions and attend a two-week summer institute. After three years of the regimen, they earn a master’s degree in education with a specialty in K-6 mathematics.

According to Ken Gross, the UVM professor of mathematics who created the program’s curriculum and masteredmind its basic approach, VMI teachers earn more than a degree.

“As their knowledge base grows, that’s transformed to confidence,” he said. “Teachers who in the past were reluctant to spend time on math in the classroom now say it’s their favorite subject to teach. They develop self-confidence to not just teach rules but engage in a math discussion with their children.”

Gross and math instructors like Gamble bring about this transformation not with new age hocus-pocus, but by emphasizing, of all things, the mathematics itself— and plenty of it. “Our motto is ‘Competence leads to confidence,’ ” Gross said. “We want teachers to have a deep understanding of mathematical content. That’s the core philosophy of our program.”

VMI evaluations routinely overflow with the enthusiasm of a recruit who has survived boot camp. “This continued on page 4

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class has affected me more than any staff development I have done,” wrote one teacher of her first VMI summer institute. “The content of this course is impressive and has been challenging every day. I appreciate this course because so many teacher training courses contain 90 percent activities and 10 percent content.”

Why should elementary school teachers learn more math than they’ll be required to teach, venturing into the realms of advanced algebra and trigonometry?

“That’s like saying language arts teachers shouldn’t be required to read past a sixth-grade level,” Gross countered. “Our goal is that if you don’t know a lot more than K-6 math, how are you going to know what’s important and what isn’t? How can you assess the curriculum? How can you know what not to teach?”

Deb Armitage, mathematics assessment consultant at the Department of Education and one of three master elementary school teachers who helped Gross develop the VMI model, uses a cooking analogy to describe the benefits of the initiative’s approach. “We grew up in a microwave math environment,” she said. “We learned formulas and got instant answers, which we promptly forgot. At the VMI, we’re in crockpot mode. We plug teachers in and let math ideas simmer and process. When VM teachers see something in a book, they know why it’s there and where it’s heading.”

In addition to emphasizing math content, VMI has a pedagogical component. Between sessions, a team of field workers, all accomplished elementary teachers steeped in the VMI method, visits schools to help VM participants integrate what they have learned into their classrooms practice.

While VMI wants to influence its participants, in some ways it sees them as a means to an end. “It’s not enough for teachers to change their own practice,” Gross said. “We want them to act as mentors for other teachers in the school and as leaders in helping develop an action plan to improve math instruction school wide.” The VMI curriculum includes courses designed to boost participants’ mentoring and leadership skills.

The VMI model calls for at least one graduate to be placed in every elementary school in Vermont, evangelizing the program’s core values and approach. Beginning this summer, the program will be fully implemented, when 35 new teachers join VMI’s ranks, bringing the total to more than 100.

Gamble is asking her first-year VMI class another tough question. “What’s the minimum number of roots a quadratic equation can have?”

“The answer is zero,” three or four teachers shout simultaneously.

“Very good,” says Gamble. “If I’d asked you that question this morning, you’d have looked at me like I was nuts.”

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