

Colleges pick up slack on math

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Ralph Bravo, 29, offers ideas on a problem to Brian Witham, 18, last week in a Tacoma Community College math class designed to bridge the gap between high school and college. Esther Walker, 18, works behind them. Last year, 4,000 students enrolled in remedial math classes at the community college.

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Valerie Morgan-Krick of Tacoma Community College details a problem involving exponents last week in her Math 88 class, an introduction to algebra.

Washington's math gap has graduated and gone on to college.

As policymakers tussle over when to require passing a math test for a high school diploma, community and technical colleges are dealing with the reality of thousands of students each year who enter without basic skills.

Of the 37 percent of 2005 high school graduates who went right into those two-year schools, 46 percent took pre-college math classes.

At Tacoma Community College alone last year, that amounted to 4,000 students enrolled in Math 90, an algebra class usually taught in ninth grade. That was roughly 130 sections of that single course.

Such remedial classes rob time from the students as well as the colleges. Tuition pays for about a third of the cost of providing a course; the state reimburses colleges for the other two-thirds.

"It's a cost to the student, the college and the taxpayer," said Tim Stokes, TCC's vice president of instruction.

Math deficiency isn't a new problem, but it's getting new attention.

Last year's high school sophomores were supposed to be the first class required to pass reading, writing and math assessments in order to graduate, but nearly half failed the math section. Now lawmakers are considering delaying the math graduation requirement and education officials are reviewing how math is taught.

If students wait after high school to go to college, officials know they can't help them retain those math equations for years. But they hope they can make a dent in the number of students fresh out of high school who either haven't taken math in two years or who never completed the level of math they needed to get ready for college.

The state's Transition Mathematics Project is working to come up with standards for math concepts students should learn in high school, without specifying the courses they should take.

Bill Moore is the project coordinator.

"In Washington and nationally in the past decade, there's been a growing attention to the notion of college readiness, of trying to get more high school graduates ready for college-level work," said Moore, who's a policy associate for assessment, teaching and learning for the State Board for Community and Technical Colleges. "That level of skill really will prepare them for the widest range of options, not just college but the workplace."

Math is the biggest problem, he said.

A Complex issue

Our collective math problem has many sources, Moore said.

"It's a larger cultural and society issue about mathematics – who's good at it and who's not," he said. "People will happily admit that they're not good at math. So, if you have parents with those attitudes, that affects public perception about how much math you need."

Part of the solution might be a marketing and education campaign to tell students why math is important and vital for certain careers.

Another issue is that the state requires high school students to take only two years of math. Students who take those classes their first two years of high school can be rusty by college.

"In our project, I think there is a general consensus that the Washington state minimum is way too low and it is way out of step with other states around the country," Moore said.

Some high schools require more math. But discussions statewide of whether to raise the requirement meet with questions, including whether more math comes at the cost of electives and whether the state has enough math teachers to offer three or four years of math to all its high school students.

The other question, Moore said, is how to present math in a way that appeals to all kinds of students.

Could math be integrated into an art class? A social sciences class?

Moore said the math experts he works with don't believe anyone other than math majors or engineers need calculus, but many times the only upper-level high school math classes available are pre-calculus and calculus.

Emily Sullivan, a math instructor at Bates Technical College, is frustrated by students' poor math skills. She acknowledges that math teachers sometimes are at fault for students' lack of interest or even fear.

"I think what's happened over history is that math teachers, because we're mathematicians, we try to create little mathematicians. And there's maybe 1 percent of the student population who's interested. We've kind of left everybody behind. The classes are dull. We need to make it something they're going to have fun with."

In her college-level classes, she uses M&Ms candies to do statistics problems about decay and licorice sticks to do triangle structures.

Math anxiety

One recent afternoon in Valerie Morgan-Krick's Math 88 class – a TCC introduction to Algebra class usually taught in eighth grade – students right out of high school mingled with students who talked about their pre-teen children.

The mood was light. They laughed, they teased one another about being too noisy.

Morgan-Krick called the z's in the equations "zebras," the x's

"xylophones." She reminded students to depend on their process, solving equations with letters and numbers. She introduced exponents and warned them.

"There's the temptation to say one to the fourth power is four," she said. "That's the dark side calling to you."

She rejoiced in a collective, "Oh!" at one point, as the realization dawned on them.

"Doesn't it feel good when you kind of wade through all of that and you get there?" she said after they solved an equation full of numbers, letters, parentheses and an exponent or two.

Heather Fraley, who graduated last year from Foss High School, said after class that she felt like her high school teachers were more interested in disciplining students than teaching them.

"I never really understood," she said. Now, "I am happy. I understand math!"

Another recent high school graduate, Erika Spencer, said she was mad that she had to pay for high school-level classes.

Morgan-Krick said every student in the pre-college classes she teaches has a story of how he or she got lost in math.

It might have been parents who didn't understand math and didn't think it was important.

It might have been a clash with a teacher, or an embarrassing moment in class. It might have been that the student's learning style just didn't mesh with the teacher's style.

"There are so many places where a person can get lost," she said.

TCC even offers a class for students with serious phobias. Linked with a human development class, it's called "managing math anxiety," and a counselor joins them in it.

Morgan-Krick said she doesn't know where these students are going, whether they'll all recover from the deficiencies.

But she remembers a student – a woman in her 30s – who was in her classes several years ago and had a dream of being an architect. The woman e-mailed Morgan-Krick years later to say she was graduating from

Washington State University's architecture program.

"I think every student has the ability to come back around," Morgan-Krick said.