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## Unlocking Mathematics for Minority Students

by John Franklin

José Franco knows what it means to struggle. He knows this because he watches his female students struggle every year—not to learn but simply to have the opportunity to pursue an education in the first place. "There are cultural expectations that some families have of Latina girls that can impede their pursuit of advanced math courses," says the director of EQUALS, a program aimed at promoting mathematics access for minority students. Many times, Latinas have told Franco that they have to convince their parents that being allowed to go to school is a good option, he says. "But I'm blessed to work with them, because they are great students and hard workers."

Combating low expectations by parents and others is a familiar challenge for many teachers. Beset by cultural prejudices, poor resources, and frequent misconceptions, many minority students—Hispanic, African American, and Native American alike—"tune out" of math classes at an early age because higher education is not considered a necessity or even an option. Getting them to "tune back in," experts say, often requires changing the way parents view education, the way teachers view their students, and—above all—the way students view themselves.

### The Dangers of Unconscious Prejudice

According to Franco and other officials, educator misperceptions are a common problem when it comes to minority students and mathematics. Low expectations by faculty

contribute to the reasons that "a disproportionate number of minority students are not in college-track math courses," Franco says.

Other experts share his view. "In some instances, when an African American child goes to enroll into an upper level math class, the student is questioned as to whether he's in the right class," says Anthony Scott, president of the Benjamin Banneker Association in Chicago, Ill., an organization dedicated to improving African American student performance in mathematics. "You have a lot of low expectations out there that need to change if kids are to succeed."

But race is not the only reason for misunderstanding, experts say. Linguistic differences can also cloud a teacher's perceptions of a student's abilities. "If a child does not speak English, teachers may wonder how that student can do math," says Eleanor Linn, chair of the National Council of Teachers of Mathematics Diversity Advisory Committee. The student may be a year and a half ahead of his U.S. counterparts in mathematical ability, she says, but "the teacher's assumptions may be different" because of the language factor.

Such assumptions by school officials can have far-reaching consequences. "We asked a number of our Native American students how many times their counselors talked with them about preparing for college," says Grace Boyne, K–12 program director of the American Indian Science and Engineering Society and member of the Navajo nation. About 80 percent of the students said that their counselors did not even discuss college preparation with them, she says.

### **Making the Necessary Changes**

As formidable as these challenges may seem, many officials believe that they can be overcome if the right steps are taken early enough in students' lives. Educators can use a variety of techniques to help stimulate and motivate students to study math.

"One of the biggest problems for Native American students is a lack of role models," says Rich Sgarlotti, projects coordinator for Hannahville Indian School in Quinnesec, Mich. "Since many parents do not graduate and go on to college, they don't see a need for advanced math instruction for their children."

Recently, that trend has begun to change, he notes. NASA astronaut John Herrington, a Chickasaw Indian who flew on the last space shuttle mission before the Columbia disaster, made a point of writing and visiting Native American students to discuss his experiences. "He even came and met a lot of our kids at a summer camp," Sgarlotti says. Seeing Herrington and hearing his experiences helped the students understand "that they can do whatever they want to do with the right education," Sgarlotti adds.

But inspiring figures can also be found closer to home, officials say. "Parental involvement is crucial to education," says Irvin Vance, executive director of Benjamin Banneker. If children don't get nurturing support from parents to help "push them through," he says, "they begin developing an attitude toward not just mathematics but all academics. It's not that they can't learn; it's that there's this impediment that results and undermines learning."

One of the most successful programs for helping students improve their arithmetic skills is Family Math. "Family Math is where parents and children do highly engaging mathematical exercises together," says Linn. The activities are usually held at schools or elsewhere in local communities so they can be attended easily. The programs feature games and exercises with mathematical themes, such as dominoes, counting exercises, or number puzzles. "It can be very helpful for parents who have not had much formal education themselves to see what kinds of strategies work for helping their children learn math," she adds.

In addition to activities outside the classroom, some teachers have found that using popular frames of reference during class can help energize student involvement. "One teacher I know has her 6th grade students imagine that they are 19 and need to plan for moving into their first apartment," Linn says. "They need to budget how much they'll need for rent, for food, and so on. It helps engage the students and keeps them interested."

Other strategies for getting students to tune in include using practical applications of mathematics that resonate with students' ethnic backgrounds. "In some of our math classes, Latina students plan budgets for their *quinceañeras*," says Franco. The *quinceañera* is a celebration of a girl's 15th birthday and is similar to the "sweet 16" party commonly held for teenage girls. In preparation for their parties, "Hispanic girls use mathematics to plan budgets, determine measurements for rooms, and calculate the number of refreshments needed," Franco adds.

Educators also can stimulate minority students' minds by finding historical examples of their ancestors' achievements. "Look at the pyramids," Sgarlotti points out. When you see a picture of one in a math book, "it's always an Egyptian pyramid. But the tallest pyramids in the world are actually Mayan." Using such references, he says, can help forge ties in students' minds to the important role mathematics has played in their histories.

Other cultural traditions might fit into lesson plans as well. "A lot of times, students are not aware of the math and science backgrounds in their communities," Boyne says. "Whether you're designing a canoe or using the right chemistry for pottery that you must bake at a certain temperature, that's math and science. We need teachers to focus on being able to teach these things within the Native American community."

## Caring About Learning

Despite the differences in backgrounds and expectations, however, sources agree that all students have one thing in common: They need caring adults if they are to succeed, says Scott. "If you find an African American student not doing well in class and ask why, the general answer is 'the teacher doesn't like me,'" says Scott. "Teachers need to know and need to care."

Parents must be encouraged to support learning as well. "Part of the reason so many Latino children are not in college-track courses is because their parents and families do not understand how the school system works and the implications of not taking the right math courses," Franco adds. "They don't know that if their child is not enrolled in algebra by a certain time, that that will have implications for high school and beyond. It's not that they're not interested in their child's education; it's that they just don't understand."

Parental understanding and support is invaluable for student success, educators say. "If parents believe that their kids are capable of learning, those kids have a far greater chance of succeeding," says Linn. "And that's true regardless of how much math the parents know themselves."

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