Equity: Can Pathways Help?

The NCTM Principles and Standards 2000 include six important principles. One of these is equity.

"Excellence in mathematics education requires equity—high expectations and strong support for all students. National Council of Teachers of Mathematics Principles and Standards for School Mathematics, 2000"

Inequities in mathematics education and achievement are well known and long standing—we often refer to the achievement gaps between majority and minority, rich and poor, girls and boys. Curriculum is an important resource for closing these gaps. Pathways was designed to provide better access to mathematics for underserved students in several ways. Pathways provides

- reasons to learn mathematics.
- resources for developing mathematics from everyday reasoning.
- a program balanced among skills, concepts and problem-solving.
- opportunities for teachers and students to do their best work together.

Real world applications provide reasons for learning mathematics. All kids want to know, "When are we going to ever use algebra (or geometry, or statistics)?" The issue is more critical when students' lives outside of school make high demands on their time and attention. Why should students pay attention in mathematics class?

For middle schoolers, working on design problems from the world of adult work is enticing. And the idea of addressing problems from life is appealing. Both of these have been real motivators in Pathways classrooms. As we developed the materials, we worked in diverse classrooms and observed this again and again. For example, one student--who would not carry a piece of paper or a book outside of class --avidly worked on designing a dream home and the graph-making activities that went with it. He stored his work in his partner's notebook, but he did math, every day.

Many people initially wonder why we picked strange and far off places like Antarctica as the settings for our projects. While not all projects have this kind of adventure theme, we do try to pick topics that are equally strange to all students. When no one in the class knows much about the frozen south, every one is on an equal footing to begin with. This approach has advantages over topics such as skateboards or music or sorts in which one group of kids might know far more about the topic than anyone else does.

Real world settings are resources from which students can reason. An important strategy for addressing inequities is to encourage all students to bring their everyday reasoning into the classroom, and use it in solving mathematics problems. Students who retain the belief that mathematics is a foreign way of thinking unrelated to what they already do are unlikely to develop deep mathematics understanding. By providing realistic problems to solve, we leverage students' reasoning in the classroom.

For example, when a student-architect places a sofa in a scaled room, she has a mathematics problem to solve. She can use her ideas about how big a sofa should be to see if she has the right answer or not. Measuring a sofa in the teacher's lounge can replace checking an answer in the book, and she will have a great deal more confidence in her answer than to a traditional word problem, where the answer may make mathematical sense, but be absurd in the real world.

Pathways is balanced among skills, concepts and problem solving, We recognize that all of these aspects of mathematics learning are important for addressing the achievement gaps. Under-served students need the immediate tools to improve performance on high-stakes examinations. Just as important, however, are opportunities to develop deep conceptual understanding of mathematics, allowing young people to use mathematical reasoning when addressing significant problems in the world around them. These are the keys that open the doors to a broader array of adult choices.

Pathways is designed to be pedagogically eclectic, allowing teachers savvy at working with the underserved to use their best strategies. And when students are doing Pathways, their solutions are unique, requiring teachers to pay attention to what each student is saying and doing, another proven strategy for better serving underserved students.

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