

Students, Families, Communities, and Mathematics Teachers

An often quoted proverb suggests that it takes a village, or a community, to raise a child. The proverb might be slightly altered to suggest that it takes a family, a community, and a teacher to educate a student in mathematics. As a mathematics educator, I believe that we are convinced that a teacher is needed to educate a child mathematically. We expect to see children successfully learn when they are in a classroom with an appropriate curriculum, a highly qualified teacher, and support materials and technology, along with a supportive school administrator. But that is not enough; it takes a community and a family for real success. Let us consider why.



We have long known that family members are a child's first teachers. Some of us were fortunate enough to learn counting on our grandfather's knees and to learn to read similarly, using a daily newspaper. It is also frequently true that once a child has entered school, the child becomes more dependent on the school and less dependent on the family for learning. Particularly in mathematics, where a child may have been taught aspects of fundamental counting—possibly counting money—and maybe telling time at home, we frequently reteach each of these concepts as if they had never been learned at all. Although there may be conceptual reasons why some of the concepts may need to be retaught, it is also true that we may be missing a golden opportunity to capitalize on preschool learning. These examples simply illustrate that students do not come to us as blank slates and that we might be more effective if we capitalized on the education that families and a student's community may have provided before the student came to school.

Learning Outside School

Further, if we do not consider what and how a student learns outside of school and ignore family and community influences, we run a huge risk of making learning much more difficult for the student and mathematics irrelevant and impractical. Consider, for example, a family member who teaches a child a traditional algorithm for computing while we are letting the child develop an alternative algorithm for the same purpose. If we do not allow the student to use both, we are setting up a conflict between the student and us, between the student and the family member, and eventually between the family member and us. How could we manage the situation in a different way to take advantage of the "outside of school" learning? Consider the different types of algorithms. We have an obligation to teach students why the algorithms either do or do not work. That goes for alternative algorithms as well as traditional ones. Perhaps a good way to handle this type of situation is to invite the family member into the classroom while the explanation of algorithms is taking place. Or, alternatively, a family math night can be built around having students demonstrate their learning.

Similarly, we may not be making use of the mathematics that older students may be using in their jobs outside of school. Not being able to make change or balance checkbooks is frequently used by adults as examples of the lack of knowledge that students and recent graduates of high school have. Perhaps inviting employers to mathematics classes to explain just whether or not making change is important in a business and inviting bankers and tellers to come to explain potential errors and results of not being able to balance a checkbook might be advantageous to future graduates. In any event, the use of community members to explain just how daily tasks use mathematics may give students, community members, and us insight into what we might need to be doing.

Missed Opportunities

The real message here is that we may be missing opportunities when we do not use family and community members to help students learn. We can benefit from both. An example of NCTM materials that were influenced by both is the Figure This! CD and Web site (www.figurethis.org). Classroom teachers and mathematics educators wrote the challenges. Widmeyer Communications helped by testing the materials with students and families. They helped the writers and developers understand that frequently the language that was used in the project was not the language understood by people outside of school. On the majority of the challenges, families had many questions—so many questions that the writers had to rethink their questions and solutions. As a result, the writers began to carefully consider the mathematics language used in the classroom and how it was interpreted by those outside the classroom. Everyone involved began to consider how families might view tests given in the classroom. Most began to think about the fine line between correct mathematical language for the classroom and the language commonly understood outside the school. We all need to think about our students' welfare; we can learn from their families and their communities. For the sake of our students, we must.

