

## President's Message

# Engagement as a Tool for Equity

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*This President's Message is the second in a two-part series on improving mathematics learning by all students.*

Today, we have a responsibility to make relevant mathematics content available to a much broader range of students than traditional mathematics curricula have served in the past. In the October President's Message, I discussed what I believe is an essential element of effective mathematics instruction—teachers thinking in fresh ways about the nature of the mathematics curriculum they teach and about how they teach it. This month I'd like to talk about another element that greatly affects student achievement—the active engagement of students in their own learning. This student engagement is perhaps our most important tool in our battle for equity.

Many excellent teachers have discovered that their students can be more successful when they are engaged in doing mathematics—writing about mathematics, modeling mathematical situations, discussing mathematics, exploring mathematical ideas—rather than watching their teacher do mathematics. This means teaching in ways that are different from the way in which most of us were taught—by being told what we needed to know. Today's most successful mathematics classrooms look considerably different from even the best classrooms of my childhood, where lecture by the teacher was the mode.

Although there is no single model for all classrooms or for all learning styles, many teachers now structure their teaching so present their students with a challenging problem or task, either from a real-world context or a compelling mathematical context. After some large-group discussion of the problem, students may work in pairs or in small groups on the task. This element of small-group discussion is an important aspect of engaging students, since they benefit from talking about the mathematics they are doing, sometimes making conjectures, discussing, justifying, even arguing about methods, approaches, or answers. The teacher may be available as needed, but often the teacher's intervention takes the form of asking questions to push students' thinking (How do you know? What makes you think so? What would you do if there were 5 items instead of 50?).

Teaching for student engagement does not mean running an unstructured or disorganized classroom. On the contrary, students in a classroom focused on engagement may have clear and well-defined expectations from the teacher. An important element of this type of teaching is helping students connect their work on a problem or task to the specific mathematical concepts or skills represented. Helping students make these connections, so that they know what mathematics they are learning, is the culmination of this work. Through these connections, students are more likely to recognize similar situations in the future where they might use the

same or related processes. The teacher can ensure that students solidify these connections by having them maintain a journal or notebook that captures the important mathematical ideas, skills, and definitions resulting from their work.

Implementing a classroom model based on student engagement may call for a minor adjustment or a major shift. Some teachers who use large-group lecturing as a primary teaching tool already vary and enrich this approach by actively encouraging students to ask questions during their lecture and with guided practice. For these teachers, adjusting to less telling and more facilitating, combined with offering more opportunities for student discussion, may yield positive results. Other teachers may need to take a hard look at the effectiveness of their teaching approach for the majority of students and may need to make a more dramatic shift to engage students and see the results they want.

There are many variations on classroom practices that actively engage students in their own mathematics learning. But implementing any approach based on student engagement can raise many questions for teachers. How does this approach foster computational proficiency that is likely to be on a high-stakes test? How do I adapt existing materials for a more engaging approach? How do I learn to pose questions to stimulate students' thinking, especially if I don't necessarily know all the answers? These are important questions that can form the basis for many types of professional development and support for teachers. In addition to professional development, teaching for student engagement calls for course materials that are conducive to engaging students in rich tasks. It also requires at least as much work as preparing a good teacher-centered lesson. But the labor is clearly worth the effort when student engagement leads to learning for more students than we have ever reached before.

From my perspective, I can offer several questions for your consideration (and for my next President's Chat). Are you listening to the little voice inside you that asks you whether you are doing all you can to engage all your students in their own learning? Do you have some examples to share of student-engagement strategies that help all students, including those who have not been previously successful? What models have been most effective for you? What lessons have you learned that might help other teachers engage their students? What programs and services can NCTM offer that would help you and your colleagues improve your ways of teaching?

I invite you to share your answers during my next online President's Chat, scheduled for 3:00 p.m. ET on Tuesday, November 16. Visit [www.nctm.org](http://www.nctm.org) at that time to join the discussion.