EQUITY: MATH FOR ALL

Committing to Equity: Going Beyond Teaching Mathematics

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Editor's Note: Before each of our CCTM fall conferences, an article written by one of the main presenters is featured so that members can glean a sense of what the speaker values and session attendees will be delving further into.

As I think about the new school year beginning, I know that teachers review the Academic Mathematics Standards they are responsible for teaching, prepare their classrooms, and make detailed plans. They reflect on what was learned in the past years from both students and colleagues, what insights and new ideas were gathered from professional development attended or research read, and consider the classroom procedures they want to put in place for all students to be successful. After all, it is a new year!

Quality standards, an aligned curriculum, and effective teaching practices are necessary elements to achieve student learning in mathematics. If we want to maximize learning for each student in our classrooms, we must address the essential elements necessary for successful mathematics programs. They are: a commitment to access and equity, a powerful curriculum, appropriate tools and technology, meaningful and aligned assessment, and a culture of professionalism (NCTM, 2014). A commitment to access and equity requires not only believing that all students can learn mathematics but also employing actions aligned to that belief. There are many actions, all important and necessary, that will impact the goal of achieving equity in- and access to- school mathematics. I present a few actions, some of which are not often targeted because one might not think them directly related to the teaching and learning of mathematics. I do!

High Expectations and Support

All students are capable of learning mathematics. Unfortunately, not everyone nor every teacher believes this. A student's race, class, culture, language and gender, more often than not, negatively influences the beliefs about a student's ability to learn. Beliefs, policies and practices need to be examined by all educators and actions taken to ensure that schools, classrooms, curriculum, instruction, and student placement deliberately give each student an opportunity to learn. It is essential that mathematics tasks be engaging and accessible to all students, yet maintain rigor. If not, tasks should be adapted or replaced with a clear focus on the grade-level mathematics that students are expected to learn.

In addition, as educators, we need to be aware of our language and eliminate (or challenge) any deficit language that we say (or hear) in conversations. Labels such as "low kids" and "high kids" are unjust as they privilege some and marginalize others (NCSM & TODOS, 2016). Grouping students by perceived ability results in inequitable mathematical experiences with the "low kids" traditionally not being given the same opportunity to learn mathematics as the "high kids". Tracking and grouping students into low-level groups, as well as labeling students as "slow," have damaging effects on the expectations of both teachers and students and should be eliminated.

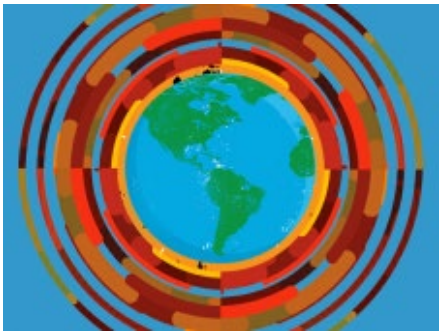
All students, including English language learners (ELLs), need support while learning mathematics. We expect students to engage in mathematics, reason, explain their thinking, and critique the reasoning of others. Students whose first language is

other than English need processing time and support to speak aloud, engage in discourse, produce correct sentence structure, and use precise mathematical language (Celedón & Ramirez, 2012). For example, a teacher of a second grade classroom of ELL students was concerned because her students would not speak aloud, thus not engaging in discourse. To address this, the students became actors in a play, learned their parts, and produced language aloud in front of others. The play involved them in speaking memorized lines, so the cognitive demand was low, yet the emotional demand was high as they feared making mistakes (Ramirez & Tapetillo, forthcoming). In this case, the teacher had high expectations, raised the students' comfort levels in speaking aloud in front of others, and developed a classroom culture where students openly shared, asked questions, and discussed mistakes. The students did not learn any mathematics by participating in the play, but they developed the skills to participate in a mathematics discourse community, thus affecting their ability to learn mathematics.

Supporting students can vary. Teachers support students while exploring tasks by asking questions, helping students consider what they know, fostering the use of representations, and not thinking for the students. They support students in developing conceptual understanding using the Concrete-Representational-Abstract model of instruction when applicable and guide students to make connections between these stages and various representations. Teaching ELLs requires on-going support so they can learn English while learning mathematics and be active participants in a mathematics discourse community. To support students in problem solving, teachers can focus attention on understanding a problem situation, at times giving no numbers in a problem, to enable students to attend to what is happening in the situation, and consider what students are asked to find without being distracted with numbers. The use of anchor charts and interactive mathematics notebooks benefits students in conceptualizing mathematical ideas, using precise language, utilizing multiple tools and strategies, and applying mathematics. In addition, on-going classroom-based assessments support student learning by allowing the teacher to determine what students know, build on that knowledge, and move students forward mathematically. Instead of asking why doesn't a particular student know a particular concept, we should be asking what the student knows and understands, and how we can use that understanding to facilitate further learning?

Building Relationships

In addition to having high expectations and supporting students learning mathematics, it is important to recognize and act on the need to build relationships with students and build on their culture, conditions, and language (NCTM, 2014). In many of our schools the teaching population is not representative of the student population. Thus, in order to be responsive to students' background and experiences, educators need to interact with students, listen to students, learn about their community, and work to understand students' perspectives.



In a recent study of an intervention to improve teacher-student relationships, preliminary research indicated that when teachers saw similarities

between themselves and their students, the achievement gap was reduced by more than 60 percent. While more research is needed to generalize the findings to a larger population, one cannot ignore them completely if we are concerned about making a difference in student achievement (Gehlbach & Robinson, 2016). Thus teachers may consider actions or activities to determine what similarities there are between themselves and their students, thereby taking a step in building relationships.

In the spring of 2010, Arizona passed a highly controversial and tough immigration bill, Senate Bill 1070. Aware of her students' personal struggles and learning distraction with the passage of this bill, a 5th grade teacher recognized the need to pull the class together and give them time to ask questions, discuss their concerns and feelings, and let them know that she cared about them. After the discussion and clarification of the law, the students were ready to learn. This exemplifies a teacher who is concerned about her students' personal and emotional needs and understands the importance of building relationships with her students. Now consider the racial turmoil that occurred this summer in the United States, and reflect on how it might be affecting students emotionally and how it might affect teacher-student relationships. I ask you to consider steps that a teacher or other educators can take to open up dialogue with students to unfold their concerns and understand their perspectives. Granted, immigration and racial turmoil may not be related to mathematics, but open class discussions let students know that their teachers are interested in things that matter to them, thus affecting student interest and desire to learn.

Building Student Self-Confidence

For some, their lack of success in mathematics is related to their lack of confidence in themselves as a learner of mathematics. Students, and often their parents, believe that one is born with or without a math brain. Some educators even foster this idea. These beliefs are unproductive and need to be addressed. Not only should educators develop a growth mindset, they should facilitate their students in developing one also. A growth mindset stresses that learning is the result of effort, that all students are capable of learning mathematics, and that mistakes cause one's brain to grow (Boaler, 2016).

Having a growth mindset works in parallel with having high expectations and believing that all students are capable of learning mathematics. Developing a growth mindset in our students will build their self-confidence as mathematics learners. It is an intervention that is inexpensive, requiring both teacher and student learning, and a teacher's dedication to continually use growth mindset language and reinforce growth mindset thinking in students.

Conclusion

In order to implement the eight Mathematical Teaching Practices effectively, there must be a commitment to access and equity. High expectation of students, classroom support to reach those expectations, building relationships and addressing student self-confidence (even though they may be without a mathematical context) are important if we are to affect students access to- and equity in- mathematics.

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