

# Philosophy of Math Education

Jessica Thomas

There is a revolution taking place in mathematics education. The days of teachers presenting algorithms to students, of students memorizing formulas, of teachers assigning never-ending waves of practice problems, of students working individually on irrelevant problems, are disappearing. Now, they will work together to find multiple solution paths for real-world problems, and they will use their knowledge and understanding of numbers and structure to overcome any issues they encounter. This math revolution has caused me to realize that I will not spend my career teaching math—I will spend it teaching students how to reason, how to problem-solve, how to construct arguments, and how to think more critically.

These skills can be developed through a classroom emphasis on the eight Standards for Mathematical Practice. These standards go beyond the traditional math content standards and challenge students to persevere, construct arguments, reason, critique, model, use tools, and see patterns. These are the types of skills students will be able to use throughout their lives, regardless of their future professions. My students will have a firm understanding of these practices, and they will work towards becoming logical thinkers and problem solvers. Their time in my classroom will not just give them mathematical knowledge; they will become mathematicians.

The math education revolution is not just seen through the Standards for Mathematical Practice. Classroom discussions are also vital for developing students' understanding of concepts in far better and more meaningful ways than a worksheet can. Classroom discussions allow students to share ideas, critique others, gain self-esteem, and build their knowledge while working together. In addition to classroom discussions, students in my math classroom will also have many opportunities to work with others on various projects and ideas, because learning and mathematics are not solitary activities. Students learn better when they can collaborate with others.

Students also learn better when they can participate in authentic activities and projects, which is another product of this revolution. While traditional tests are still important for gauging students' computational and foundational skills, there are a variety of other ways to assess students' skill in using and applying mathematical knowledge and practices. Students learn more from problems that are not "pretty and perfect." Problems should have multiple entry points and multiple solution methods; these solution methods should be emphasized over the actual correct answer. After all, it is more important to understand how the answer can be achieved than to know the correct answer. Knowing these methods can help students apply them to other situations that they encounter.

Memorization should almost disappear as a result of the math education revolution. Students should gain an understanding of how numbers work together; they should see patterns in the numbers and their relationships. Reliance on algorithms should only occur once students understand why the algorithms work. Students should have an understanding of where the formulas they use come from, so that they are able to derive them if necessary. Students should see a connection between the different concepts that they learn so that they can rely on previous concepts to strengthen their understanding of new ones.

Developing these types of skills will enable my students to be empowered in the math classroom. They will take ownership of their learning. They will solve problems, debate, construct, and find meaning in everything that they do. They—and I as their teacher—are a part of the mathematics education revolution.