address such questions? You may say something like "You'll need it for college" or "You'll need it to get a good job." However, these questions, as much as they sound like whining or avoidance from the work, do have some merit. One can argue that such questions are based on the notion that mathematics does not belong to the students. In fact, in schools, mathematics is most often connected to societal economic gains.[7] This is a big problem because economic grounding negatively influences the lives of disabled students.[8] In general, disabled individuals are viewed as inferior in terms of what they can "contribute" economically. However, the results of humanizing mathematics for disabled students have important implications in and out of school for these students. (Gutiérrez 2017b).

When mathematics is practiced as belonging to students, then the connections can expand beyond economics.

When mathematics is practiced as belonging to students, particularly those with disabilities, then the connections can expand beyond economics. For example, students have much at stake in the future, and their insights will be crucial to tackling societal issues such as climate change (Gutiérrez 2017a and 2017b) and theirexclusion in civic participation.

Mathematics can also be used to understand the social injustices that disabled individuals face in and out of school and to address those injustices.[9] For instance, in some places in the world, disabled individuals are often forced to live on the outskirts of a central city where they have limited access to various services, such as health care, employment, housing, and so forth. For such phenomena, mathematics could be used in classrooms to document the results of these societal injustices and then craft ways to address them. Expanding the meaning of mathematics in classrooms to more closely connect to the human experience and its corresponding affect, individually and collectively, can enable all individuals, whether with or without disabilities, to use mathematics to benefit society.

The Tale of Two Paths in Mathematics Education

In the remainder of this chapter, we explore ways of thinking of mathematics as dynamic, belonging to the lives of our students as humans, and how this approach can evoke much more engagement, excitement, and positive experiences for students with disabilities.

Let's examine two classroom scenarios to reflect a bit more about what it means to think of mathematics in a new way. These are just two of many possible paths.

The first example is a mathematics study skills class for college freshmen of the type that one of the authors, James Sheldon, taught. The class is for students who are said to struggle with algebra. There are 20 students and 5 of them have diagnosed disabilities, although there may be others with undiagnosed disabilities. Desks are arranged in rows. Students have individual laptops, and they work using computerized drill and practice software that presents topics, and then drills the students on the topics until they achieve mastery. Of course, beyond the sphere of the classroom, one might also ask who gets placed here and why? Who makes those decisions and under what criteria? How fair are those determinations? Regarding whose mathematics, to what extent does this classroom exclude or include students as mathematics knowers and doers by treating them under the pretenses of remediation?

The second scenario is a resource classroom with nine fourth-grade students with named disabilities such as "dyslexia, dyscalculia, dysgraphia, and ADHD" (based on a classroom described in Ratcliff and Anderson 2011). Students are exploring mathematics using Logo, a computer software program that lets students draw on the screen by controlling a virtual turtle. Students take the initiative, work collaboratively, and engage both in unstructured exploration and in structured activities developed by the instructor.

In these scenarios, the classroom can be viewed either under an approach centered on individual student considerations (the phrase "meeting the needs of students" may come to mind here) or as an enriching and humanizing place where mathematics is created and explored by students and teachers as they interact with one another.

The curriculum in the first scenario is based on an individualized approach in which each student's deficits are identified, and the computer comes up with an automatically generated path for them to achieve mastery—clinical and calculating. As an observer, you might look at individual student's problems and history and check how the computer is serving as a tool to intervene. These interventions are designed to fix students' learning gaps. You would focus on the norms in this classroom, for example, that students are expected to comply to certain behavioral expectations—do your own work, work quietly, and work individually. You would notice, too, that there is no expectation or opportunity to work with classmates. Mathematics in this classroom is something that students do individually, with the correctness of their answers determined by the computer, which marks answers as right or wrong. Interactions with other students are discouraged. Students might be tempted to copy another student's work, but of course, that is discouraged by both the teacher and classmates. Independence is valued over interdependence. There are no shades of gray in this classroom, and the computer does not care why you got an answer incorrect. Students lack mathematical agency, with authority placed in the computer rather than in the students. Interactions with teachers primarily involve teachers showing approved, correct methods to students. The focus is on students' disabilities and how they might help or hinder students' use of the programming software. Beyond fixing individual learning gaps, the purpose of the curriculum is unclear.

By contrast, in the second scenario, students are expected to work collaboratively, they help each other out with their work, they are positioned as knowers and doers of mathematics, and they have opportunities to meet together and reflect on their progress. Students also have opportunities to connect mathematics to their lives, their lived experiences, and draw upon their assets. This scenario aligns more to the mathematics "of" concept instead of mathematics "for." The classroom in this instance fosters the idea that there are different types of knowledge, different ways of knowing, and different knowers (Gutiérrez 2017a). Mathematics in this classroom is something that students build together under the guidance of a teacher rather than the teacher or a computer acting as the sole source of mathematics knowledge. Interaction with other students is encouraged and valued. Mathematical correctness and approximations are something students determine for themselves when they see what their programs draw. Although the teacher might occasionally point out something that students have missed or support them to refine an algorithm, students maintain their authority as mathematical agents in this classroom. This means that students who have traditionally struggled in mathematics or those with disability labels are not "treated" with remediation because there is the idea that they have mathematics deficits or that their mathematics experiences have to be disconnected from who they are. Instead, paths are created where these students are valued as integral in advancing the field, in providing solutions to our society's problems, and in producing improvements at the present and into the future.

> Mathematics . . . [should be] something that students build together under the guidance of a teacher.

The first scenario signals a "transmission" model of mathematics education, according to which students with disabilities are positioned as unknowing and unable to know regarding mathematics. Students are asked to repeat a process and reproduce other people's ideas (Greenstein and Baglieri 2018), the "boogeyman's" mathematics. In the end, students (not just those with identified disabilities) do not understand what they are doing or why they are doing mathematics a certain way; they just do it to get it done or to get a desirable grade. They come to think of mathematics as something foreign, disconnected from them and who they are. Some of these students then aspire to become teachers but come to think of mathematics as their "weak" area. This leads to tremendous stress that can greatly affect, often negatively, their emotions and thought processes. Nonetheless, they have to teach mathematics (e.g., as an elementary teacher) or support the teaching of mathematics (as a secondary special education teacher). The cycle of fear of mathematics may be interrupted, or in a worst-case scenario, passed on to the next generation of students. Alternatively, there are many paths to better connect mathematics and students with disabilities than the traditional transmission path.

Up to this point, we have described some of these paths and their power to make mathematics more engaging, exciting, and connected to who students are individually and culturally. More important, by humanizing mathematics, it is more likely that we will better understand the inequities that individuals with disabilities encounter and then seek to address them.

Transforming Mathematics Classrooms

Expanding the meaning of mathematics can transform your classroom by taking pathways similar to those in the second scenario. In our collective experience working with prospective and practicing teachers of mathematics, we find that they usually have a very good grasp of the mathematics content they are obliged to teach. That is, the mathematics come in the form of state- and district-level mandates and suggestions (e.g., pacing guides) as mathematics standards that teachers should cover for the grade or subject level they teach. Less clear, however, are the process and practice standards, in other words, the "how" of teaching mathematics. In the United States, such standards are delineated or derived from the eight Common Core mathematical practices and the National Council of Teachers of Mathematics (NCTM) five Process Standards (2014). These "how" standards can be useful for educators to align their practices similarly to the teaching methods of the second scenario. Teachers of mathematics may be familiar with these through professional learning or their teacher preparation programs. However, when it comes to supporting students with disabilities in mathematics, these programs are not enough. In the next few chapters, we describe additional elements that are necessary to powerfully transform mathematics classrooms and that extend its power beyond the school walls.

Conclusion

In this chapter, we have described how mathematics can be much more than what usually counts as knowing and doing mathematics, particularly when it comes to supporting students with disabilities and ensuring that mathematics is something that belongs to them. For many individuals, with or without disabilities, their mathematics education experience was filled with anxiety, fear, and trauma. Instead, if we, as educators, expect all students to have powerful mathematics minds (Boaler 2015), to connect mathematics to their world and experiences, and to think about mathematics beyond what happens within school walls as a tool that can reshape their world, then we can anticipate that mathematics will be much more enjoyable and meaningful.