

Educational institutions have remained stagnant factories for generating students that are trimmed to think of the one, correct answer. In fact, the pedagogy in mathematics presents ideal examples of this paradigm. Since learning addition, students have been led to believe that there exists only particular ways to achieve a solution, where a direct and linear method of thought is preferred. There is either a right or wrong answer.

This drives away an entire audience for various reasons. Math becomes boring. Classes are repetitions of series of memorizations of theorems and endless problems that have seemingly zero relation to the society. It becomes increasingly difficult when one begins to fall behind on mastering a certain concept, causing a vicious cycle as concepts build and depend upon another. Furthermore, because assessments are highly and easily quantified, meaning the right or wrongness of an answer is clear, grades can become a strict measurement of success in the classroom. In other words, it is easily identifiable by this measurement when a student starts “falling behind.” The existence of this measuring stick can not only create competition that drives students into feeling mathematics is stressful, but also induce unhealthy perceptions about themselves as a mathematician.

Particularly, mathematics courses are often required first or second year courses for all majors at many higher education institutions. For this reason, most introductory courses are giant, taught with little individual support systems, often led by a single or few instructors, and as standardized as possible. This would involve how assessments are used in evaluating student understanding to equalizing the pace of when things are expected to be taught and learned. Standardization does not consider the differences in student backgrounds. The concept of “fun math” is long gone as students enter higher education. Lecturers have no time for class-wide discussions that invoke student participation and variation of perspectives on the topic, never mind time to take questions. In the viewpoint of the institution, this method is cost effective and easy, like herding sheep into one big pasture rather than individually feeding them according to their needs.

To illustrate just one consequences of viewing mathematics education as a factory, I give a very possible and realistic example of how this disregard can impact a student’s performance. Suppose a student was not able to attend a professor’s office hours because they were working a part time job that overlapped those hours. For this student whose working hours are necessary to attend school in the first place, they were unable to receive the help that would have benefitted and supplemented their learning. Because of this, the student must rely on finding other resources, or on themselves, both which may require more effort and time, and perhaps even money to make happen. Now I compare this student to another student whose tuition is paid for, and thus has time to attend office hours or spend time doing extra practice. The same assessment is used to evaluate the students’ understandings of the material.

Notice here there are zero references to the academic capabilities or intelligences of each student. Yet, it is clear how one student may perform better than the other, for reasons completely unrelated to understanding the material.

Thus, it makes sense when the performances of students in these classes end up in wide, bell-curve like distributions. For students, this distribution can easily become a matter for concern. In comparison to those who are interested in mathematics or math-related fields, for those that do not, these courses can be intimidatingly difficult.

Such a trend in mathematics education further affects students’ perceptions of themselves as mathematicians as well. A score or grade based on quantitative assessments is nearly unquestionable in the way it situates itself as the sole way to judge one’s capabilities in mathematics. A poor score can lead to oneself believing they are inadequate of mathematics

learning, whether it be in not being talented or smart enough to do so. Yet, extending the example from before, this conclusion is not necessarily true.

Furthermore, the existence of the aforementioned measuring stick acts can as a punishing one. Students that are perceived to be performing poorly according to this stick will likely have a difficult time liking the subject itself; a cherry on top to finish the sundae of rote memorization and forced endless practicing.

Perhaps most importantly, mathematics is a field that seems at first completely devoid of societal implications. I only need to give statistics of the number of full-time white male faculty members holding Phd's in mathematics to see how this is not true. According to surveys conducted by the Conference Board of Mathematical Sciences, as of 2005, 66% of all full-time faculty members holding Phd's in mathematics were white and male. In stark contrast, approximately 1% were black and male, and 0% were black and female.

Before I try to explore what these numbers can imply, I want to retell the story of an ugly duckling. The ugly duckling saw in its reflection something unlike all others around him, made fun of by both himself and others. He only realized his beauty and feeling of belonging until after he saw other swans that looked like him.

The story of this duckling is not unlike the stories of the many students of color, ethnical and sexual groups that constantly are pressed by society as ugly and unfitting. The biggest difference here is that these students do not have a flock of swans waiting for them at the end of the story. Indeed, there are only more individuals that do not resemble identities they resonate with.

This is crucial in determining whether they seem to "fit" in the mathematical society, especially in higher educations. That there are practically close to zero black female faculty members implicate there are no role models for the numerous black and female students. It is difficult to imagine how one can feel like they can succeed in a field where no one else they know of that looks like them have.