Teaching Philosophy

I believe that students are naturally curious and that mathematics can be a fulfilling outlet for students' innate interest in creative problem solving. While the content may differ from course-to-course, some of my main goals as an instructor in mathematics always include the following:

- Cultivating curiosity and developing students' creative problem solving abilities;
- Building an inclusive, supportive, and self-sustaining learning community;
- Helping students develop their written and verbal mathematical communication skills;
- Facilitating the understanding that "mathematical ability" is developed through practice and is not an intrinsic or immutable quality.

Cultivating Student Curiosity

Mathematics is a collaborative discipline, and as such, I often spend the bulk of my sections asking students to work in groups on meaningful and challenging problems. A good math problem not only sparks curiosity, but leads students to asking about extensions and connections. When discussing problems either in section or in office hours, I always try to show different solutions side-by-side. This serves several purposes. Some students may find one solution easier to follow based on their own mathematical background. Understanding all of the solutions develops a richer understanding of the material, and gives students more tools for solving future problems. By celebrating the different approaches to problem solving I hope to reinforce that doing math involves creativity, not just applying procedures algorithmically.

Building an Inclusive Learning Community

In all of my classes, I strive to create a classroom community that is inclusive to all students, and where students feel comfortable taking risks. Risk-taking in a classroom setting not only takes the form of students being willing to share their thoughts or solutions, but also takes the form of students being open to admitting when they don't understand something. When answering questions, I try to make students feel safe, included in the work of problem solving, and part of an intellectual discourse. Sometimes I share with students my own experiences of having difficulty with material, both to normalize and destigmatize the experience of confusion and to share resources which I have found particularly helpful. In one of my most recent teaching evaluations, a student wrote: "...this TA has never made me feel stupid, which happens often in the math department as a femme in STEM. I would have dropped the class had it not been for this TA."

Developing Mathematical Communication Skills

As an instructor of mathematics, I try to emphasize the importance of clear mathematical communication. Many students feel (often guided by their previous math experiences) that math is about finding the correct answer, and that clarity is secondary to "correctness." However, imprecise communication contributes to the misconception that mathematics is only for those who "get it." Well-written proofs or explanations are invitational—they walk the reader through a solution, pointing out potential

misconceptions along the way, and serve to expose the underlying solution strategy. Moreover, developing solid communication skills benefits students at all levels in the classroom. Students with strong mathematical communication skills can more clearly articulate their thoughts to their peers. The inherently collaborative nature of communication also increases student interaction and further strengthens the classroom community.

When I TA for our intro to proofs course, I usually have students spend class time writing proofs in groups and presenting their solutions to others. As students work collaboratively, they not only learn to communicate their own ideas clearly, but they also develop the crucial skill of determining the validity of others' mathematical arguments.

As the instructor for Math 3A, I asked students to write an expository essay on a major concept from the course in lieu of a final exam. Students learned how to use LaTeX to typeset mathematics, practiced writing polished mathematical exposition, and researched extensions and connections of their chosen topic to other disciplines or other areas of math.

Mathematical Ability is Developed, not Innate

Many students come into courses with the preconceived notion that one is either “good” or “bad” at mathematics. This notion that mathematical ability is innate and immutable has often been reinforced by previous experiences in the classroom, and is particularly harmful for identity groups who have been systematically excluded from the mathematics community at large.

The reality is that mathematics is a skill which is learned and practiced like any other. Confusion is a part of math and a part of learning, and recognizing what you don't know is the first step toward understanding. When I design section worksheets I intentionally create separate spaces for scratch work and final solutions. Doing so normalizes the challenge inherent in learning and encourages students to take risks.