

TEACHING STATEMENT

SABINE J. LANG

During my own experience as an undergraduate student, I never felt comfortable speaking up in class. Every time the teacher asked a question, I looked down at my piece of paper. I avoided eye contact, hoping that they would not call on me. I did not realize it at the time, but this was a significant source of stress for me, and I missed out on learning opportunities because of that. I was still amazed by the beauty and rigor of mathematics, which made me persist in the field. At that time, I did not realize that mathematics could be more profound and beautiful when done as a team. Most of the major papers are published by several authors together. New problems come from fruitful discussions. I now understand that there is no point in trying to do mathematics alone.

As an instructor, creating an environment where mistakes are part of the learning process is one of my priorities. I do not want any of my students to feel pressure or a sense of competition. I want them to feel comfortable in my classroom: It lowers their stress level, lets them focus entirely on learning, and allows them to cooperate. For this purpose, I focus on creating an inclusive, tolerant environment. I also include active learning and group work activities, because it makes the students feel that they are part of the class, and enables them to understand the beauty of collaboration in mathematics.

In my classroom, students should feel free to try a problem, struggle productively, and learn from their mistakes. I always make sure that their efforts are valued, even if they do not lead to the correct answer at first. When students are working on their own, I walk around and offer guidance as needed. When they make a mistake, I take the time to go through their reasoning with them, identifying what part was right and what needs to be changed. I believe that it is crucial to pause, go back, and understand what the issue was. However, it is equally as important to empower the students by emphasizing when they came up with correct ideas.

Several students still think of classes purely as the instructor delivering content while they are passive. If this is their belief, they are often surprised after stepping into my classroom. Learning is an active process, and I want to introduce my students to the joy of doing mathematics, and not only watching someone else. When I start a new topic, I let my students discover it first. Some try to adapt techniques they have seen in previous classes. Others come up with new ideas or an intuitive understanding of the concepts. Through this exploratory phase, I let the students analyze the new material and its complexity. Therefore, the methods used to tackle these challenges appear to be more meaningful to them.

I appreciate how students can get very creative with their approaches. I use it to emphasize that there is not just one right solution, but so many distinct ways to get to the same point. I share with them how much I love this aspect of mathematics. To this purpose, I often let students present their results to the class. I give them the option of an oral presentation or a short written report to accommodate different learning styles. It is an opportunity for students to practice communicating their results in mathematics, using specific vocabulary. I never give a grade for such presentations, although I reward their participation and efforts.

These assignments are a good indicator of the students' conceptual understanding of a specific topic, and it helps me adjust my teaching as needed.

Nevertheless, I have often seen students who had great work on their piece of paper but would refuse to share it with the class. When I talk to them, the explanation I hear the most is that they think someone else has a better answer. Even if they like mathematics and tackle hard problems, many people do not perceive themselves as capable. I try to be very transparent with my students about what unique perspective they would bring to the class with their work, and it usually convinces them to share their strategy. It is so gratifying to see how happy they are when they realize that their peers have learned from them too.

I believe teamwork is essential not only to see the beauty of mathematics but because I do not think that anyone can succeed alone. Students have an easier time navigating college when they know their peers. They can share perspectives on a topic, discuss the material, bounce ideas, but also encourage each other. This support is what made me persist in mathematics. I would not have made my way through graduate school without my colleagues. Group work in the classroom is one of many tools I use to create this community and support system for my students. It also teaches them how to collaborate, which will be an essential skill for their professional life.

For example, I included an hour of challenging problems and applications at the end of every single chapter in my Discrete Mathematics class. Each group had a different set of exercises so that there is no sense of competition between them. Students had the chance to explore the course material differently and to get creative with the course content. I spent time with each group, offering guidance or help as needed. As the instructor, my role in this setting was to make sure that each student can contribute. If one student was ahead, I asked them to explain their reasoning to their peers. It was my way of valuing their work and allowing others to catch up before they could move on to the next step together.

Besides focusing on creating a tolerant environment and including a lot of active learning and group activities, I keep self-reflecting on and renewing my teaching. I use as many opportunities as I can to develop my practice. Workshops, seminars, discussions with colleagues are keys to my development as a teacher, as well as readings or online classes on specific topics. Most importantly, I keep learning from my students, their needs, their reactions to the methods I use, and their feedback. I want to use the available resources to guarantee that my students get the chance to enjoy mathematics.

By working actively on making my students comfortable and giving them a voice in my class, I have seen significant changes. It makes my students more determined to succeed since they know that the classroom is their space. I have noticed a difference in their persistence too. They know I am on their side and want to support them, and they do not hesitate to question me again and again until they understand the concepts. The beauty of mathematics and the joy of solving challenging problems become available to the students when they do not have to worry about their learning environment.