

Teaching Statement

Both Pennsylvania State University and University of California, San Diego are public land-grant universities with a diverse student population. Being an instructor in these universities has given me a chance to teach students from different backgrounds. In the past few years, I taught a variety of mathematics courses, prepared my own teaching materials, and shared my teaching experience with other instructors. I have had numerous opportunities to interact with students in different capacities, from the lectures in classrooms to discussions during office hours. I believe that six years of teaching has not only qualitatively improved my teaching ability, but also enhanced my understanding of the whole education system. Moreover, it has helped me gradually formulate the following principles which are the basis of my teaching philosophy.

I show my students that mathematics is a discursive activity through classes that offer plenty of opportunities for interacting. I stress equal participation from all students enrolled in my classes and I strive to make all of my students feel that they are welcome to contribute their thoughts, questions, and answers to the in-class discussions. To set the mathematical tone for the class, I frequently have problems on the board that either require students to recall material from previous lectures, motivate the topic to be covered during the day's class, or both. Since the problems often review concepts from the previous lecture, they are a low stress opportunity for students to present their work on the board. Not only is sharing solution strategies a great way for students to solidify their understanding of the material, but it provides students with a chance to practice communicating their ideas and receive feedback on their work.

Effective communication with students contributes to a positive student-teacher relation. It serves as a bridge between the teacher and students and helps the creation of a class environment conducive to learning and achievement. I believe that, the more I connect or communicate with my students, the more likely I will be able to help students. I encourage students to ask questions in class, and to provide feedback and critiques of my lectures. I also invite students to my office to discuss any issue that they do not fully understand. When giving lectures, I always try to speak clearly and slowly in order to make sure that students understand what I am presenting. Moreover, important issues are always highlighted on the blackboard to help students catch the main points.

Motivation is another important aspect of teaching, especially for mathematics courses. Many mathematics courses involve abstract concepts and theorems which are complicated for beginners, so I always spend time explaining why the subject is important and interesting through examples and stories which make it easier for students to learn. For topics such as autonomous equations and their stability analysis, I draw the phase lines on the board, meanwhile present some real-life examples like the spread of contagious diseases. By multiple ways, students can understand the subject better. Once students begin to feel interested in the subject, they also became more receptive to the concept. Whenever possible, I link the basic concepts with my own research in applied mathematics so as to illustrate to the students the usefulness of the mathematical concepts.

Equally important as the motivation, another aspect of my instruction is to engage students in mathematical reasoning. When I work with students on understanding a problem, I emphasize its conditions and conclusions: What does the problem take for granted? What is the desired outcome? What does this mean about checking whether a candidate for a solution really satisfies what the problem seeks? I have found that asking students to examine the conditions and conclusions in a deliberate way helps them to see what knowledge might be best applied, as well as how to see mathematics problems as something to make sense of. In this way, I make mathematical reasoning accessible. The unpacking of conditions and conclusions applies as well as theorems, propositions, and lemmas. By teaching students to identify explicitly the conditions and conclusions of mathematical statements, I give them the tools to appreciate

the logical structure of proofs and explanations of mathematical results.

The use of technology increases the effectiveness of my teaching. I have used MATLAB and MATHEMATICA to help students engage with mathematics through visualizations of concepts they are struggling with and demonstrating alternate ways to check their calculations. These softwares particularly help me illustrate better geometric concepts. In one instance when I taught Ordinary & Partial Differential Equations, I showed students draw the slope fields and ODE solution branches using MATLAB, and the visualization help the students understand the concepts easier. The use of technology also allows me to provide prompt feed-back to students and keep students better engaged. Over the past years, I persevere in checking emails on an hourly basis and replying students' emails promptly, which make the students feel that I care about them and am willing to help them whenever they have questions on the materials. Another example of technology in instruction is the use of PIAZZA in class, a free platform for me to efficiently manage class Q&A, from which students can post questions and collaborate to edit responses to these questions, and I can also answer questions or endorse students' answers.

I love teaching mathematics and I enjoy sharing my knowledge, wisdom and experiences with my students. I have been improving my teaching skills throughout my career. I strive to have my students keep the zest for learning, questioning and discovering after they take my course.