Teaching Experience, Methods, and Philosophy

During my career as a graduate student, I have had the opportunity to teach in a variety of settings. In addition to being a Calculus recitation instructor, I have served as the lecturer for introductory mathematics classes such as College Algebra, Trigonometry, and Pre-Calculus. I have also taught Contemporary Math, an applications oriented course designed to teach quantitative reasoning and problem solving skills to students majoring in the arts and humanities, Multivariate Calculus, the third semester calculus course for math, science, and engineering majors, and Concepts in Geometry, a proof based course in Euclidean and Non-Euclidean Geometry for junior math-education majors. I was responsible for writing my own lectures, exams, and projects in each of these courses.

In addition to my experience as an instructor for university level courses, I spent a year working with Project Fulcrum, an NSF funded GK-12 project that teams graduate students with elementary and middle-level teachers from Lincoln Public Schools. I spent ten hours a week working with 3-5th grade students at an elementary school helping to enrich the math and science curriculum with “hands on” activities. I learned a lot working with classroom teachers at the K-12 level. I also worked one summer at Power Math Camp, a week long summer camp for middle school students who have excelled in mathematics. I taught two workshops each day on topics including graph theory, game theory, and cryptography. I supervised social activities in the evenings and served as a chaperone in the dormitory at night. Finally, I spent two years as a workshop leader for the Math Excel program. Math Excel is a two semester program for students in the introductory calculus sequence, based on the program developed by Professor Uri Treisman at the University of California at Berkeley. Students in the program enroll in a workshop course which replaces the standard recitation. In the workshop, students spend time working cooperatively on problems designed to expand their conceptual understanding of the course material. The program emphasizes social interaction both in and outside of the classroom, with a goal of creating a scholarly community.

The experiences I gained by working with a wide range of ages and ability levels have helped me develop as a teacher. Being exposed to different teaching styles has helped me to find a style that suits me, has made me open to trying new things, and has encouraged me to continue to improve as a teacher. With this in mind, I would like to say a little about what I try to accomplish in the classroom.

Good teaching begins with clear goals and a vision for what one wants to accomplish in the classroom. As an instructor, my primary goals are creating a positive learning environment, helping students master the subject matter of the course, and encouraging them to develop as both scholars and individuals.

It may be surprising that I give precedence to establishing a good learning environment. However, in my experience, setting the right tone in the classroom has a profound effect on the way a course unfolds. For this reason, I make it a priority to spend time at the beginning of each course communicating how our class will run and what my expectations are. I let my students know that, although my goal is to challenge them, we are in this together and I will do my best to help them succeed. It is important that they sense that I care about them, that they believe that they are capable of doing well, and that they know that the effort they put into the course will be rewarded. They must be
made to understand that there is value in what they are learning and that they will be treated with respect and graded fairly. The classroom needs to be a safe place to ask questions and make mistakes. Finally, I make it a priority to get the students talking and working together as quickly as possible and to help them see our class as a community rather than just a group of individuals.

Once this tone has been set, getting the actual subject matter across is much easier. I expect the students to come prepared to learn, so I come prepared to give a clear and organized presentation of the material. I introduce new concepts using motivating examples and emphasize connections between new material and previous concepts. I give frequent opportunities for students to ask questions. I have often found, however, that this is not enough. Students often think that they understand a concept once they are able to follow my presentation of the material. Afterwards, when they are asked to apply the material, they can run into difficulties. For this reason, I make it a priority to allow time for supervised practice -- either individually or in small groups -- and I emphasize the importance of additional practice on homework assignments. I encourage students to form study groups outside of class and to get extra help by coming to my office.

Although I do my best to be approachable and to help my students learn, I also believe that my students are responsible for their own education. I can help them, but they must do their part by coming to class and studying outside of class. They need to seek help if they are having difficulties and they need to keep trying until they succeed. Since not every student is self-motivated, I give frequent quizzes to encourage them to keep up with the course material and to help them gauge their understanding. I also like to give group projects that require students to apply and expand on the concepts that we have been learning. Finally, since it is important for students to get a sense of how the material we are learning fits together, every few weeks I step back and give an overview of the course content.

Setting the right tone and communicating the subject matter are important, but it is also important that students leave my class having developed both as scholars and as individuals. Many students, particularly those in introductory courses, feel that they will never find themselves in situations where they will need to use the methods and concepts that they learned in our class. Even if this were to be the case, my goal is that each of my students will develop skills and abilities that will serve them wherever they go in life. They will have learned the value of discipline and diligence by seeing the results of attending class, taking notes, reading material, and doing homework. They will also have developed their interpretive skills, the ability to read and follow directions, and their fluency in both the conceptual language and computational procedures of mathematics. They will have learned to ask questions, to persevere and keep trying when learning is difficult, and to communicate effectively both verbally and literally. They will have improved and developed their abstract thinking and problem solving skills, and they will have the experience of integrating a cohesive body of knowledge.

Ultimately, my goal is that my students will learn to have a genuine love of learning. My hope is that they will develop critical thinking and creativity and that they will begin to appreciate the aesthetic beauty of mathematics and how it can be used to better the world around them. These values and skills will serve them throughout their academic career and beyond.