

For as long as I can remember, I have wanted to be a teacher. Perhaps I just wanted to be like my parents, maybe I knew I could be good at it, but it has always been my dream. Upon entering college I had plans to teach mathematics in high school, and coach football. Three years later, while taking a Linear Algebra exam something changed. During this exam, in the last few furious moments of writing I experienced a moment of transition from not knowing, to knowing. This moment spurred me to pursue mathematics further and it is moments like this that I want my students to experience.

Everyone’s got it, but not everyone gets it. Misha Gromov might say that “ah-ha” moments like the one above are transformations in the *binary nature of mathematical perception*, since for him one either has no inkling of the idea, or the idea is too embarrassingly obvious to say aloud. Indeed, it is often heard, regarding mathematics, that “you either get it or you don’t.” From this perspective good teachers have one thing in common; they believe that, to some degree everyone already “gets it”, and challenge to the teachers is to uncover within the student what the student already knows. In my classes I use a carefully thought out progression of examples to help students gain confidence with the ideas. I also help them “get it” by connecting new ideas to commonplace ideas, mathematical or otherwise.

A focused learning space. When I immerse myself in a learning activity, free from distraction, I notice subtle connections which lead to new insights. Realizing the value of a focused learning space, I try to create such a space for my students as well. I use several techniques to remove distractions from my classroom and I encourage students to do the same for themselves. This focused environment facilitates an intimate and personal experience with mathematics, which is critical to appreciate many of its interesting nuances.

A potpourri-of-perspectives approach. Students have many different needs and reasons for learning mathematics. I strive to prepare dynamic, engaging lectures with student-centered components in hopes of inspiring and piquing curiosity. I have a conversational style of teaching and I build rapport with the students to create an open classroom where ideas are shared by both teacher and student. I use misconceptions and mistakes to illustrate possible pitfalls, and present the subject in a variety of contexts which include the pure, the applied, the local and global. This potpourri-of-perspectives approach is one way I relate the subject to a diverse group of students.

Methods and techniques. I prepare my classes thoroughly, but work slowly through examples to model realistic problem-solving behavior. I encourage students to ask questions and to interrupt me if they get lost during the lecture. Each day, I remind students of the previous day’s material and conclude with a summary of the main ideas. To move beyond the didactic style of teaching I will often devote time in class for student-centered and cooperative work on examples and projects. Many believe as I do, that one of the best ways to learn something is to teach it to some else, and when effective, group work creates a focused learning space where students teach other students. I strive to minimize factors that make group work ineffective, which include distraction, lack of direction and poor classroom management on the part of the teacher.

I invite students to discuss the course with me outside of class, and this direct contact always helps the students learn. I often demonstrate the use of mathematical software like MATLAB and Maple in class and I provide a myriad of resources online through a dynamic class website consisting of a schedule, homework aids, writing tips, study guides, screencasts and pencasts of lectures, problem solutions and more.

My teaching experience. I finished my degree in mathematics with teacher certification and completed my Student Teaching at an inner-city high school in South Carolina. Using small group activities, manipulatives and creative analogies I was able to see transitional moments in students who proclaimed to hate mathematics. As a Masters' student at Wake Forest University, I was the primary tutor for Calculus I-II and I learned how important motivation is to learning, and I came to believe that students learn best when the content is presented in a context relevant to them. As a Ph.D. student, I taught eight courses at the University of Utah, and during this time I developed a practice of "bringing the world into the classroom". For example, I used daily newspapers to illustrate the uses and abuses of statistics and musical instruments to illustrate resonance and frequency. I occasionally held class outside and this natural context was particularly useful for discussing fun topics like fractal geometry and the golden mean. During the fall of 2011 at Colorado State University, I taught a graduate course for engineers which focused on linear algebra, ordinary and partial differential equations. In the spring of 2012, I will be teaching an introduction to ordinary differential equations.

On technology. I often use computing resources in my teaching to illustrate the power of visualization and computation. The homework exercises I assign often require the student to use some kind of computer algebra system. My quizzes typically require only work done by hand. I do not believe that students should rely too heavily on such machines, however, and I try to find a balance between the two extremes. I have used software such as Matlab, Maple, Mathematica, and WebWork in classes I've taught and I continue to explore other software packages.

A unique and creative educator. I have had unique experiences which help me to connect with people in many ways, from teaching math to disadvantaged youth, writing a PhD. dissertation in pure mathematics, working as a Central Intelligence Agency funded postdoc on applied problems, teaching and guiding whitewater kayaking and rafting, thru-hiking the entire Appalachian trail, and playing college football. I share stories from these experiences with my class, and this often seems to draw students closer, leaving them more receptive to the mathematics I am sharing with them. I bring to the classroom the sense that anything is possible with hard work, perseverance and an open mind. I require from my students hard work and perseverance, and I intend for them to leave my class able to think and reason critically, with an open mind.

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