TEACHING STATEMENT

When I talk to people outside of academia about higher education, a common question is "What do you think about online classes?" Usually, they are curious about the rising trend of large, distance-learning courses and what they mean for the status quo. They also tend to believe the hype that one day soon there will only be a handful of universities left. I think this pessimistic outlook comes from a basic misconception of the fundamental role of an educator. We do not simply hand down knowledge to our students, for then textbooks would have made us obsolete long ago. Our competitive advantage remains the same and revolves around interaction and individualized instruction.

Throughout my educational career, I have witnessed and participated in a variety of methods for fostering both interaction and individualized instruction. From my undergraduate days working as a Lab Assistant in a self-paced and computer-based Precalculus course, through graduate school with TA and Instructor work in traditional and online environments, and up to my current position teaching at a small liberal arts college, I have found this to be the key component to engaging students and helping them master the material. Obviously the techniques that work in a classroom of 25 students might not be appropriate in a larger class or an online class, but focusing instead on the intended effect can lead to good adapations and a unified viewpoint. For example, in a small classroom, a question or prompt for questions and a quick scan of the room can pick up on confused students too shy to speak up. In online courses, we can replicate this with a brief poll. These techniques are dissimilar in both preparation and execution, but from the viewpoint of student learning they become isomorphic.

Most important however is the variation from student to student. When I was a high school student, I was part of a pilot program introducing Calculus through guided discovery. There were certainly students that thrived in that setting. (In fact, at least one went on to earn a PhD in math.) Unfortunately, this was a rigidly applied cirricular change and I saw several previously strong math students struggle with the format and fall behind. A program that works wonders for one student can often fail miserably for another. With that in mind, I always strive to maintain a mixture of approaches in the classroom. I try to take advantage of the power of students discovering concepts organically, but I feel this needs to be kept in moderation. Some portion of the class, usually due to anxiety, needs to cling to core lecture time. Outside of class time, the differing preferences can easily be catered to. The trick thus is to carefully plan the class time to move between styles with some frequency. My general tactic is to start with traditional lecture with multiple viewpoints on a basic topic in order to get every student at least one form of intuition. This seems to get the more anxious students moving with a fair amount of momentum. I am a visual and geometric thinker, so the lecture step tends to involve mostly prep time considering other possible approaches. From there, hopefully they won't notice as much as examples they are given start to branch into new ideas. I then like to move to the harder end of the spectrum with group work on a problem. Some students will find the way through a key step and experience that moment of revelation, but all of the students will at least have spent time discussing the concepts. We can then reconvene, picking up new questions students found while trying to talk about the problem and catching everyone up on the solution. I have been praised in TA evaluations for this "open-ended format," and most students I have asked directly indicated a preference for this as well.

As with any math teacher, the issue of math anxiety weighs heavily on my mind. In my experience, students with high levels of math anxiety spread it evenly across the material, the specific course, and the instructor. In a service course, I don't have much control over the material. If I can make the course and myself less intimidating though, then the anxiety over the material often starts to erode away. I try to run a relatively relaxed classroom and have been praised as "down to earth" and "very calm, sincere, and respectful to students." Once I convince a student that I am more of a guide than a gatekeeper, that student can view me as an ally instead of an obstacle to finishing math classes.

I worry equally about the stronger end of the class. The more involved group exercises can help keep the strong students engaged, but too many of these would burn everyone else out. I try to handle this by sneaking in hints of deeper concepts during class time and elliciting discussion outside of class. Optional "Challenge Problems" also seem to help. This combination has not only significantly reduced the number of bored faces I have to look at, but has also led to independent study projects with several students. With my focus on individualization and interaction, these projects have been some of the most rewarding educational experiences I have had.

Over the past several years, I had the opportunity to teach mathematics in a number of settings and at almost every level. As a graduate student , I was able to gain experience in a traditional classroom environment, a distance-learning online setting, and a centralized tutoring center. Additionally, my teaching duties ranged from a pre-calculus course through the full range of calculus courses, differential equations, and linear algebra, as well as tutoring students from upper division courses. I continued to expand my background at adding experience teaching upper division and graduate courses in analysis and geometry. At my current home , I am teaching calculus and a mixed precalculus/calculus course in a student-focused liberal arts program. In addition to strong teaching evaluations, in 2009 I received the Award for Excellence in the Teaching of Mathematics. This is an annual departmental award for the graduate student who "best displays the love of teaching, love of mathematics and concern for students." Teaching evaluations are available upon request or from my webpage:

Evaluation Summary

Semester	Course	Mean/Scale
Spring 2013:	Introduction to Analysis	6.1/7
Fall 2012:	Elementary Differential Topology	5.6/7
Summer 2012:	Calculus (II)	5.3/7
Spring 2012:	Elementary Differential Topology	6.2/7
Fall 2011:	Differentiable Manifolds	5.3/7
Spring 2011:	Introduction to Analysis	6.2/7
Fall 2010:	Differentiable Manifolds	5.7/7
Spring 2010:	Calculus II (Physical Sciences and Engineering)	4.1/5
Fall 2009:	Linear Algebra	4.7/5
Fall 2008:	Calculus III	4.6/5
Spring 2008:	Differential Equations with Applications	3.9/5
Fall 2007:	Calculus II (Physical Sciences and Engineering)	4.1/5
Spring 2007:	Calculus I (Biological and Social Sciences)	4.6/5
Fall 2006:	Calculus III	4.4/5
Summer 2006:	Introduction to Calculus	4.1/5
Spring 2006:	Calculus III	4.4/5
Fall 2005:	Calculus I (Biological and Social Sciences)	3.4/5
Summer 2005:	Calculus I (Physical Sciences and Engineering)	4.2/5
Spring 2005:	Calculus III	3.6/5
Fall 2004:	Calculus I (Biological and Social Sciences)	3.9/5