

Teaching Statement

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Mathematics is like an enormous cavern. Theorems support the weight of the structure, formulae and definitions fill the space glittering like gems, passageways lead to unknown depths. Mankind has long been attracted to this cavern, endeavoring to explore and explain the fantastic structures filling the space. As mathematicians we lay out paths so that others may follow in our footsteps and visit the sights we have seen. Sometimes after laboring long and hard to get to a destination we turn around and find ourselves only a few steps from where we started. Other times vistas open up, showing us deep truths from afar, without any clear paths leading to them. The passageways often twist and intertwine, connecting seemingly different areas of mathematics.

When we teach our students, we are inviting them into this cavern. Often times we are merely asking them to stand near the door and peer in. Other times we guide them along well-trodden paths to see the great pillars of calculus or algebra holding up the bulk of science. At other times we drag our students into some depth of the cave, with only our experience and intuition to light the way. Some students begin developing their own intuition – casting their own glow on the surroundings. Others are content to observe by our light, happy for the tour, but also happy to leave the cave once the tour is over. Still others are cowed by the darkness, blind and stumbling over the difficult terrain, struggling even under our guidance. This diversity of attitudes makes guiding the tour difficult; Simultaneously leading the blind, trying to show the tourists the sights, and inspiring the future mathematicians to explore new paths and find new gems of their own.

The best guides are knowledgeable and enthusiastic. They are knowledgeable of the route, know the ground underfoot, and can simultaneously traverse the terrain and point out interesting sights along the way. Good guides love the territory they are exploring and delight in watching others learn the terrain. They encourage independent exploration and help the struggling manage their way. My goal is to be an energetic and interesting mathematics tour guide. I try to be responsive to my students, teaching to their strengths, and providing many ways of exploring the terrain around them. When possible I try to provide motivating examples, give graphical and analytic ways of thinking about the subject, and encourage independent and peer learning.

In order to become a better mathematics guide, I have participated in a number of special programs at the University of Texas at Austin. These programs, the Emerging

Scholars Program, Supplemental Instruction, and Connexus, have given me the opportunity to try new teaching methods in the classroom and cover material beyond mathematics. By participating in these programs I have been exposed to class sizes ranging between 8 and 60 students. I have learned interactive methods that work in very small settings and have developed methods for reaching individuals in large classrooms.

The Emerging Scholars Program is designed to immerse freshman in a challenging, tight-knit academic environment centered around calculus. As the instructor my mission was to promote a keen interest in mathematics and science while encouraging students to develop strong academic bonds with their peers and instructors. The center of each two-hour section was a worksheet that I designed to cover calculus concepts while challenging the students to expand their understanding beyond the material in the textbook. This experience has motivated many of my Emerging Scholars to vigorously explore their interests. I am still in contact with many of these students and can attest to the value of the program.

The Supplemental Instruction Program is a program designed to teach students study skills in conjunction with the material on the syllabus. I was responsible for teaching calculus as well as topics such as taking good notes and reading a mathematics textbook. In addition to individual study skills, I actively used group work as a method to build an academic community for my students. The Supplemental Instruction Program taught me the importance of peer learning in college education.

The Connexus program aims to develop connections between different areas in undergraduate studies. As a Connexus instructor, I participated in programs outside of the classroom in an effort to demonstrate the relevance of mathematics to other disciplines. I was teamed with a Connexus focus group in the school of business; I met with my students, their advisors, and other instructors in order to tailor examples and problems with applicability to their interests.

Beyond the University of Texas at Austin, I have also had the opportunity to do workshops for high school teachers. In these workshops I covered a range of topics, from an overview of the types of problems considered by modern mathematicians to math anxiety. These workshops have given me the opportunity to address high school math clubs and to judge high school science fairs. I have found it valuable and interesting to interact with members of the mathematical community beyond what we commonly see at the university level. By working with school teachers, and introducing them to mathematical ideas beyond the standard curriculum, I hope they will inspire younger members of society to consider a path in mathematics.

I put a lot of energy into teaching, not only because I find it an important way to contribute to society, but also because I feel teaching plays an important role in mathematics research. There is a social aspect of mathematics research. Communication keeps the field of mathematics progressing. Papers, letters, conferences and seminars allow us to share our ideas and draw responses from our peers. These responses then generate new ideas and connections and can lead to new and interesting mathematics. In particular, lectures and seminars provide opportunities for knowledge flow between the lecturer and the audience. As a lecturer, I find that the quality of the feedback I get from my audience is proportional

to the quality of the lecture I have given. Most seminar audiences contain a broad variety of people: senior researchers, graduate students, and mathematicians from different areas. Thus, the ability to teach mathematics to a diverse audience is an important skill for the mathematics researcher.

I consider teaching and research equally important aspects of being a mathematician. The goal of the mathematical community is to explore the vast cavern of mathematics. Sometimes as mathematicians we must strike out on our own new paths, and other times we must trod along well-worn paths with others in tow. Both aspects are valuable to the mathematical community since together they allow us to chart the expanse of the cavern and communicate its beauty to society at large.

Overall Instructor Rating: (cumulative)

| very unsatisfactory | unsatisfactory | satisfactory | very good | excellent | total |
|---------------------|----------------|--------------|-----------|-----------|-------|
| 1 | 1 | 12 | 64 | 137 | 215 |
| .5% | .5% | 5.6% | 29.8% | 63.7% | |

Selected Comments from Student Evaluations:

“Chris was the most helpful TA ever! I did not even consider skipping discussion because I knew I would miss out on a lot. He was very knowledgeable and the material seemed to be easy for him which seemed to make it very easy for him to explain! He was definitely meant to be a teacher.”

“Chris Sinclair is an excellent teacher. In fact, he has been the best math teacher I’ve ever had. He’s a great speaker and very knowledgeable in calculus. He communicated very effectively to the class. He is the reason I actually understand calculus.”

“Chris was helpful in and out of class. He was very knowledgeable of the subject and I learned a lot from him. He pushed to give me the confidence I once had, and I think he did well. Thanks, Chris.”

“Chris has been a great instructor. His enthusiasm is contagious and he is genuinely interested in the class.”

“He is a very good TA not only because he knows the material very well but because he makes everybody in the class involved. If I have to pick a TA again I will certainly pick him.”

Awards:

2001-2002 Frank Gerth III Teaching Excellence Award