Teaching Statement

Benjamin Otto

1 Background

I have taught mathematics in one way or another for a long time. In high school, I tutored my peers to earn a little spending money. As an undergraduate, I worked in the math lab, graded papers for a professor, and tutored a boy in elementary school.

In graduate school, I was a teaching assistant for courses covering algebra, trigonometry, business calculus, the standard calculus sequence, and differential equations. My responsibilities ranged from holding discussion sections to completely designing and running a course. In addition, I advised another teaching assistant as she ran her own course. I also taught in Math Tutorial, a program run by the math department to assist students at a high risk of failing. The students typically had a weak background, but were quite motivated. These traits, along with the freedom to design sessions as I saw fit, yielded an environment that demanded innovation and encouraged experimentation.

Throughout my graduate education, I privately tutored students in topics ranging from high school geometry to abstract algebra. I initially did this to supplement my income, but I found the one-on-one interactions an invaluable way to further hone my teaching skills. As part of a program called Summer Collegiate Experience, I tutored under-prepared high school students who were about to enter the university. I served on the teaching assistant evaluation committee for two years; this experience provided me access to the views of many students on a large number of teaching styles. Before graduating, I designed and taught a graduate-level professional development course for current high school teachers.

As of this writing, I have only been a professor for a couple of months, but I have already found the transition from teaching assistant to be quite rewarding. I am currently teaching Discrete Mathematics and Modern Geometry. The latter course is especially interesting, as the majority of the class is devoted to student presentations. This allows me to maximize my opportunities to interact with and observe the students. Finally, I have begun to lead some undergraduate research. I created a problem, solicited some of the math majors, and chose a student whose background and future goals best matched the project.

2 Philosophy

The goal of teaching is for the students to master the subject they are studying. Clarity, enthusiasm, organization, and communication skills are all vital elements of a good presenta-

tion, and they must be carefully cultivated. Nonetheless, the value of these skills is apparent and will not be addressed further.

The student ultimately has the greatest control over how they will learn a topic. This observation, however, does not absolve me, as a teacher, from responsibility. On the contrary, it forces me to do anything under my control that positively impacts the study habits of my students.

The student should be frequently exposed to the material; hopefully, this exposure is not limited to the classroom. Once they understand that practice reveals the logic behind what they are doing, and that this logic is a powerful tool, they are more likely to devote time to study. This is obvious to a teacher, but it is difficult for most students to truly appreciate. Moreover, it is usually a lesson that must be learned firsthand. The obvious approach is to motivate the student by assigning homework and quizzes. It is very striking to me how most students will work hard to hand in an assignment each week, even if it will not have a large impact on their grade. It should be noted, however, that this can backfire if the student perceives completing the homework to be more important than understanding the material. As always, I must be mindful of the impact I am having on the study habits of the students.

While practice is very beneficial, it must be properly directed. Working with students one-on-one has taught me that they must often learn to recognize when they are learning, or they will tend to avoid new concepts and to spend time on those with which they are comfortable. From their point of view, they are working hard and mastery will occur automatically. The error in this way of thinking is a difficult lesson. When possible, I find it useful to expect a student to be able to explain what they are doing. By verbalizing their methods, their attention is drawn from the details to the overall lesson, and they develop a better sense of what they understand and what needs more work.

Besides encouraging outlooks that aid good study habits, a teacher must steer students from those that interfere with learning. For example, the idea that some people are innately mathematical and some are not should be discouraged. If a student is expressing doubts about his or her ability, I will usually redirect the concern to address time constraints, not some perceived mental quirk, and then discuss strategies to learn the material while juggling the other aspects of life. I have found my experiences in Math Tutorial especially informative in this regard, since there my role was only to instruct and not to assess. This fact led to some candid discussions about how they view their own abilities, and these conversations have, in turn, impacted other aspects of my teaching.

3 Conclusion

The value of good presentation skills cannot be understated. Once they have been acquired, the most effective teaching techniques I can utilize involve influencing and encouraging students to adopt the study habits that serve them best, rather than demanding they adopt practices they do not yet understand. Teaching is very exciting in that I get to learn from my students and there are always opportunities to develop new approaches. I am eager to meet my future students and to face the unique challenges they will pose.