Teaching Statement
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Upon graduation this spring I will have nearly six years of teaching experience. At the beginning one of my secret hopes was to spread the joy of mathematics, and while I may have had moderate success in this I have found that enthusiasm by itself is not enough for effective teaching. Although, enthusiasm has been a very useful tool to keep students’ attention!

On my first nerve-racking day in front of a recitation class at Michigan State University I had a few basic skills that I relied on; I had enthusiasm, knowledge and examples of good teaching I had experienced myself. Since that first semester I have gained much valuable experience, and by now I have taught a variety of courses for which I prepared lessons for a diverse level of students with a range of knowledge and goals. Additionally, every week I worked in the Mathematics Learning Center where I identified individual student needs and assisted them with their homework and understanding. In the summer of 2014 I was a graduate mentor in an Research Experience for Undergraduates (REU) program with my advisor where I worked with very bright undergraduates and gained experience in supporting students’ independent advanced study.

I recall back then having a strong desire to do well by my students. Although I was inexperienced, I did have a few of ideas and plans regarding teaching. I had plans to give visual explanations whenever possible, and plans to give students opportunities to ask questions then interact with the students. My first assignment was some recitation sections. My job was to fill in holes and help misconceptions. It was a simple charge, but I was nervous, I stumbled on explanations and try as I might, sometimes students asked questions which I couldn’t understand. That semester some of my students loved me, but some found my weaknesses distracting.

In time, I gained a more assertive and confident demeanor and gained teaching experience which has helped me accurately interpret those hard-to-understand student questions. All the while I learned more ways to visually explain mathematics, and discovered more ways to clearly explain topics. This improvement was also noted in my student evaluations. However, I was not yet satisfied. There were many students who still didn’t understand, and I had a feeling that not even the best explanation would have been enough. As I reflected on this, two levels of goals took formation in my mind. The surface goals were to help students effectively solve problems and score better on assessments. Good scores make me, and them, happy. The deeper goals were about helping them improve their problem-solving abilities. To accomplish these goals I regularly use various feedback loops in the classroom which give me real-time information about how lessons are going and opens up communication with students. These include written assessments and in-class interaction.

For my lessons I usually present the material with visual explanations, but I only provide a couple examples. I always get the students involved early, even with the initial examples. This assures that they are thinking actively and helps me pace the class according to the students’ understanding. Sometimes the examples spark student questions and discussions. Instead of providing answers to questions I sometimes ask probing questions to help students answer their own questions, a skill that will help them outside class and help them gain a deeper understanding of the material. This also encourages them to answer each others questions. This I believe is especially useful. The students have a level of understanding
which is closer to each other, so an explanation from a peer may be more effective for some students. Due to the practices I implement, I have found that those hard-to-understand student questions can be clarified through more questions and student participation.

One of the challenges in this style of student-centered learning is providing feedback to all the students. For each question only a few students can get feedback since only a few can participate. To bridge this gap I make sure there is time for students to try some problems in small groups and check their understanding. In calculus, this is my main method for teaching related rates and optimization. As the students work in small groups I take the role of facilitator. The students are encouraged to discuss the problems, and through the discussions they can identify what they do not understand yet. When a group gets stumped I ask them pointed questions until they can continue their solution. My hope is that they will practice problem solving, explore freely and ask questions; progress towards my deeper goal of helping their problem solving skills.

I have given various forms of quizzes as another feedback loop. Quizzes give the students another opportunity to practice problems, but it additionally gives them an opportunity to practice their written mathematical communication skills. Proficient written communication skills, I believe, are invaluable for performing well on exams, one of my surface goals for the students. Also, understanding mathematical notation leads to a fuller understanding of the material. I have developed different kinds of quizzes based on different goals. In the case of in-class quizzes, I grade with two different colors. One for standard correctness and another commenting on how their solution reads. Many of my students do not come in with the best mathematical writing skills, but by providing color-coded feedback they are made aware of their mistakes. Now they have an opportunity to improve before the exam. I have also developed take-home quizzes which have two parts. I returned the first part of the quiz with comments on correctness and their writing, and then have students complete the second part which is a quiz similar to the first part. This gives students an opportunity to try challenging problems, get quick feedback and reward them for correcting their misconceptions as well as improving their written math skills.

Even though I now have more teaching experience, I know that I will always be learning as a teacher. I know I will continue to learn from my own students and I will learn from other experienced educators. My plan to improve my teaching is ongoing. I will always have a desire to do well by my students, and will always carry a secret hope; I wish to spread the joy of mathematics.