

# Teaching Statement

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Teaching is an important part of being a successful mathematician. Interaction with students is enjoyable and challenging. During my graduate education, I have led calculus recitations and taught lower and upper level math classes as a primary instructor for the university. I have also taught classes for pre-service teachers and spent a year on a National Science Foundation fellowship working in a middle school with the students and teachers there. These experiences have influenced my teaching philosophy in many ways, some expected and some unexpected as I explain below.

### 1 Collaborative Learning

During my first experiences as a teacher, I was unsure how to utilize group work in a medium or small math class. In 2005, I attended the Emerging Scholars Workshop at the University of Texas. This workshop is designed to prepare instructors to lead intensive calculus recitations focusing on peer instruction. These programs exist across the country and at University of Kentucky it is titled Math Excel. With my subsequent recitations, I designed worksheets for the students to complete in small groups. I learned to be there as a moderator and “hint-giver”, but not as a lecturer. The students had to help each other solve the problems. At first, it was hard not to show the students the answer as soon as they had trouble, but eventually I realized the value of this method. Students were forced to teach their peers, thereby reinforcing the learning that they had already done in discovering a solution to a problem. While working closely, the students form valuable friendships which can last after the course is over. In a large university, this is especially helpful to increase the retention rate for freshmen who are sometimes overwhelmed by the new school. Since my participation in the Math Excel program, all of my classes have had a group work component, whether it is working homework problems in Calculus II or preparing for an exam in Linear Algebra. The benefits observed from Math Excel carry over to other courses. I believe that group work and collaborative learning is an important tool for any instructor in a mathematics class.

### 2 Communication and Assessment

In a math class, students are typically assessed with exams, quizzes, and homework grades. In my courses, these forms of assessment are typically used along with an oral presentation. While not practical to have individual oral presentations in a large lecture class, most other classes do allow this. In medium sized traditional math classes, such as Linear Algebra, students can present homework solutions on the board to be discussed by the class. Courses for pre-service teachers are especially conducive to oral presentations. These students are planning to get jobs which require speaking in front of a class every day. In groups or individually, I have the pre-service teachers teach their peers. Oral presentations force students to think more deeply about concepts. Being questioned in front of one’s peers forces a student to be very prepared to discuss the idea at hand. This also allows students to become more articulate when discussing their work, a skill which is valuable no matter what discipline they go into.

I believe that students need to be pushed to communicate their written solutions clearly in words as well as with symbols. While working with middle school students, a student was asked to

explain the relationship between the numbers in the sequence 2, 5, 8, 11 . . . The student raised his hand to say he didn't understand. I repeated the written question aloud, and the student said, "Well, you plus 3 every time." He didn't have any idea how to write this on his paper, because he thought math could only be written with symbols. In the middle school, this was not a unique situation and it is often still the case at the university level. During a problem sessions with a college algebra class, I found students who could verbally explain the answer, but were unable to write a clear solution. In homework and exams, it is important to include questions which force the students to answer with words and it is important for me as the instructor to grade and give detailed feedback on these responses. Being able to communicate your idea with written words is as important in a mathematics class as in a literature or social science class.

### 3 Students

A teacher's relationship with his or her class is a very important part of being a successful instructor. I believe in an open classroom environment where students are encouraged to interrupt a lecture with questions or ask me to repeat a concept. Lecturing did not come naturally for me, and I find I still get butterflies in my stomach when I walk into a classroom on the first day to have 30 pairs of eyes staring at me. I can avoid this nervousness by drawing the students out and involving them in the lectures. I have an open door policy in my office. Any student is welcome to drop by and discuss the course. Of course, in today's world many students prefer to correspond by email. I try to answer questions as quickly as possible and promise to answer email into the evening on the days before a test. I find that students are more successful when they have more than one way to ask questions.

I maintain a course webpage for each course which will contain homework assignments, study guides, and tests. Recently, I have begun using an open source program called Moodle along with a course. Besides allowing me to post homework and tests, Moodle allows the students to submit assignments online, check their grades individually, and participate in online discussion forums. The feedback a student can receive from this kind of website helps them to stay organized and prepared for the course. It also helps keeps me as an instructor in constant contact with the students.

A teacher's job is very serious. We are working with students whose future careers will have an impact on many lives. A calculus student may engineer the roads on which we drive and our children may be taught by a student from Geometry for Middle School Teachers course. As a teacher, I know these responsibilities and do the best I can to help students in my courses receive a high quality of education. In 2007, I was named as the Royster Outstanding Teaching Assistant, and I intend to continue my career holding myself to that same standard so that I and my students succeed.