Teaching Statement
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I have always enjoyed the satisfaction one feels after solving a challenging math problem. Through my experiences with teaching, I have discovered that I feel this same wonderful sense of accomplishment when I am able to help others understand and appreciate mathematics. Whether I am teaching a course, working with students one-on-one in office hours, mentoring undergraduates in research projects, or participating in mathematics outreach programs, I strive to create a productive, stimulating, and open environment for students to learn. I try to achieve this goal by dedicating time to prepare for class, asking students lots of questions, utilizing a variety of teaching tools and real-world applications, making myself available to students for extra help, and arranging accommodations for students with special needs.

Both at the University of North Carolina (my graduate school) and Rice University (my post-doctoral institution), I have had the opportunity to teach a variety of undergraduate courses. No matter whether it is a basic math course for non-science majors or a computational programming course for engineers, I take the time to prepare myself well for each class. Creating lesson plans and working through problems ahead of time, prevents me from making mistakes in class and also prepares me better for answering student questions. I feel that my students appreciate my efforts as evidenced by some of the comments from student evaluations: “Dr. Young was a great professor. She definitely knows her material well and is able to present it in a very good manner.” and she “answers questions well and promptly”.

Listening to and answering student questions is an excellent tool for assessing students understanding of the material. However, I have found it to be equally useful to also ask the class a lot of questions. Students can be shy about answering questions in this format, but I use what I call the ”murmur meter” to get a feel for whether or not the class is following my lecture. If when I ask a question, I hear a lot of murmuring, and see students whispering to each other checking if they have the right answer or not, I know they are engaged in the material, and I feel comfortable asking a murmurer to explain their answer to the class. If instead I’m met with silence and blank stares, I know I need to backtrack and explain the concept in a different way. Another favorite tool of mine is to answer a student’s question with a question. If for example a student asks me to clarify a step in a problem, I answer the question, but end my response with ”Ok, but can you tell me WHY that is true?” . This is a great way to check that they have understood my explanation, and gives the rest of the class the chance to hear the concept described by one of their peers. Comments from students on this topic include: ”She was a good instructor who tried to gauge how well the students were following and help them to follow the class better” and ”Dr. Young is a sincere teacher who really wants her students to learn.”

Another goal of mine is to utilize different teaching tools and real-world applications to engage all of my students in learning. I taught a course at the University of North Carolina entitled “Selected Topics in Mathematics”. As instructors of this class, we are in charge of designing our own version of the course. It is a class intended for non-science majors. Students in the course often regard it as just a requirement and not a course that will be useful for their career goals. To try to change this idea, I would often introduce activities in class to emphasize the use of mathematics outside of the science world. For example, I gave the students a set of data on the various major league baseball teams that had made the playoffs. Utilizing concepts from
probability and statistics, the students made a prediction as to who would win the World Series. Based on the statistics, we ended up with an unexpected prediction for the two final teams and the winner, and the sports experts in the class were in total disagreement. The activity catalyzed an interesting discussion about how the statistics pointed to one outcome, but instinct pointed in another direction. Sports is a common theme that I utilize throughout the course as a practical application of the material they were learning.

In the course "Introduction to Computational Engineering", which I have taught several iterations of at Rice, students from all areas of engineering are introduced to MATLAB. The programming experience level of the students varies widely so it can be challenging to engage the advanced students while not losing the programming beginners. To try to peak everyone’s interest, my colleagues and I have designed homework assignments for this course that cover current topics in a variety of engineering fields. For example, the students are tasked with coding a linear program to create a production plan for an iPod company that maximizes profit. They also write codes that simulate chemical reaction networks describing RNA transcription, and state transition matrices for neural networks to describe how electrical signals propagate in the brain. I typically go over the new programming concepts by explaining the idea in words, with diagrams and basic examples on the board, and then by short demonstrations in MATLAB projected from my laptop to a large screen in the classroom. Some comments regarding this course have been: Dr. Young "explained things really well to someone who has never programmed before", "She was very effective at going over assignments and introducing computational thinking", and "A lot of the projects were really interesting".

I strongly believe in making myself available to students outside the classroom for extra help. As an undergrad (and even as a graduate student) I often felt shy asking a question in class so I would attend my professor’s office hours to clear up my confusions. I always appreciated it when the professors were available at their scheduled times and were focused on my questions and also patient with me as I built up my understanding. I try to offer a similar positive out-of-classroom experience for my own students. Besides offering help in office hours, I also work diligently to answer students’ emails promptly throughout the semester. Some student comments on this subject were “She has an atmosphere that makes her approachable with questions HUGE plus in a teacher!” and ”I’m impressed with how Dr. Young went above and beyond what was necessary in responding to my emails, answering questions after class, and extending office hours to accommodate my schedule. Couldn’t ask for more!”

Lastly, an important and very personal goal of mine is to make my courses accessible to all students, especially those with physical or learning disabilities. I have some vision impairment which makes it difficult to read normal size print, so as a student I would often need a bigger font for exams and handouts. At the beginning of teaching a course I make a point to mention if anyone needs any special accommodations to please let me know. I mention my own experience to try to encourage anyone who does need help to come forward. While teaching Calculus I, I had a student who was doing poorly on exams due to a test anxiety issue. I recommended he go to Disability Services to see if he could arrange to take exams in a relaxed environment with unlimited time. A few weeks later, I was happy to hear that Disability Services was helping him work out a plan for testing in future courses.

I find teaching to be a very rewarding experience. My six semesters of teaching have helped me build confidence and have made me realize that a career in academia is definitely what I want to pursue.