

Teaching Statement

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During my undergraduate career I was very fortunate to experience many classes with truly amazing professors who exhibited many highly effective teaching strategies. Learning under these strategies greatly shaped my own teaching, and taught me an important lesson: at its core, effective teaching is about relationships, both with the students and with the material. In particular, it is the teachers who are caring, adaptive, enthusiastic, and broad who can best foster deep, meaningful relationships with their students and with their subjects, and therefore I strive to make these qualities a central part of my teaching.

First and foremost, successful teachers are caring. Students who know that their instructor cares about their learning and well-being are often motivated to seek help and push themselves based on that fact alone. One way I show that I care about my students is to learn all of their names in the first week of classes. Because some students look very different from the photos the university has on file, I bring a camera to the first class meeting and take their pictures. I then make flashcards and study them every day until I learn their names. When I address students by name in the second week of classes, many students are impressed and express their appreciation when I collect feedback. Though it is a small gesture, I have found it to be highly motivating to students.

I also have the opportunity to demonstrate a caring spirit when I help students with their questions on the material. For example, this past semester, one of my students emailed me in tears because he was having great difficulty with the material. Though I was busy and dealing with an important personal issue at the time, I sympathized with him and scheduled a meeting with him outside of class to answer his questions. He was very appreciative, and ended up doing extremely well in the course. I believe that moments like these have a huge impact on students' motivation.

Second, successful teachers are adaptive. I have incorporated adaptiveness into my own teaching by carefully preparing each day's activities for each section of students. This past semester, I led recitations for a section of about five very strong students, a section of twenty very inquisitive students, and a section of about fifteen very quiet students. I approached each of these sections very differently, exploring alternative problem-solving methods in the first section while taking many more questions in the second. As I got to know each student better, I also began to approach each student's questions differently, allowing me to more effectively handle mixes of the above types of students in a single section. I believe that such adaptability, while certainly more difficult on the instructor, provides students with an effective educational environment tailored to their specific learning styles.

I also adapt my teaching and courses over the long term, carefully collecting students' feedback both during and at the end of the course. My students' feedback played a key part in my decision to eliminate recitation quizzes and replace them with additional practice problems in my recitation sections this past semester. This feedback affects my courses at a more fundamental level, fixing inefficiencies that cannot be solved by a quick, improvised change in teaching. I believe that this long-term adaptiveness is just as important as short-term adaptiveness, affecting the design of my courses rather than just the implementation.

Third, successful teachers are enthusiastic. An instructor's enthusiasm can often be contagious, motivating students to share in the same passion for the subject material. The excitement with which I approach problems and concepts motivates me to incorporate jokes and other "fun" elements into my teaching, making my classes more enjoyable for students. For example, in one of my recitations I decided to take my students outside, where we solved math problems with chalk on the sidewalk. The students were able to enjoy the

sun and see how their classmates were approaching the same problems, and many of them wrote how much they appreciated this in their mid-semester teaching evaluations.

Additionally, I try to convey my enthusiasm by leading students to discover the biggest key ideas in my courses rather than simply teaching them. For example, I once spent most of a recitation meeting asking students to solve a problem that they had not been taught to solve. Though they struggled to solve the problem on their own, this approach allowed them to better understand why the solution worked. Furthermore, the students that did manage to solve the problem were able to work on the additional challenge of developing a general method for solving similar problems. This approach not only allows students to be creative in solving problems, but also primes them to learn concepts which may be taught in the near future.

Finally, successful teachers are broad. Though depth in the subject material is equally important for teachers, I believe that breadth is a key factor in making the material accessible to students. When I design courses, I try to demonstrate this harmony of breadth and depth by examining subject material through a variety of activities and perspectives. In my own field of computer security, this approach is particularly effective because security vulnerabilities can occur in both the design and the implementation of systems, allowing students to see how systems are exploited through both theoretical and hands-on approaches. For example, my introductory security course has a password-cracking lab in which students analyze the theoretical weaknesses of various hash functions and apply these analyses to design fast, efficient password-cracking algorithms.

In addition, I seek to engage my students with my field in the context of other academic disciplines. With the increasing ubiquity of computing devices in our everyday lives, computer security has become more intertwined with other fields, particularly economics, politics, and psychology. Criminals are compromising financial systems with greater frequency because of the economic motivations, and governments are facing great challenges in regulating the use of the Internet. By analyzing these connections, students can take the lessons they learn in my courses with them, even if they do not pursue further studies in security.

Good teaching, of course, has many other attributes, but caring, adaptability, enthusiasm, and breadth have made the biggest difference in my own teaching and learning. In my future teaching endeavors, I hope to further refine my teaching through continual reflection on both my own and others' teaching strategies. In doing so, I hope to keep providing an effective learning environment for my students, helping them discover the great insights and wondrous applications of my field.