

MATHEMATICS TEACHING STATEMENT

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During the few years that I have spent as a lecturer and teaching assistant, I have developed a philosophy that I feel has helped my instruction and made teaching a more rewarding experience for myself and my students. I have noticed that students appreciate associating with a real person as their instructor, having clear goals set for the classroom experience, being presented a well-prepared lecture, and having their expectations exceeded. Also, many students that I have taught have classified themselves in one of two extreme groups: those that don't feel naturally good at math and those who know that they can excel. It is important to reach both types. And importantly, students want to know that they are being treated fairly or are being given a break where they can legitimately seek one. These goals can be distilled into five main philosophical points which I will discuss: 1) loving the students and the material, 2) making material and policies as transparent as possible, 3) giving serious consideration to fairness, 4) over-preparing for the students, and 5) exciting the students.

The task of teaching is made easier and far more rewarding as I give greater love to the students and to the discipline of math. Students can sense when they are being ignored or when an instructor feels bothered by them. Students can tell when an instructor is trying hard to give them help. Students can appreciate when an instructor is trying to make a class fun. A love of mathematics can be conveyed to a student, so that even if they are struggling to keep up in the class they can appreciate the elegance of the material. The combined love of the discipline and of the student can help an instructor meet a student where they are in their understanding and bring them to better love the discipline of math. A subject which is well-loved will generally be better understood. A subject which

seems overly mechanical and memorized is disliked or quickly forgotten. Classroom participation is improved with greater rapport. A higher regard for the students makes it much easier to admit a mistake made at the board. With more love, an instructor can appropriately bring personality and humor into the lecture which could otherwise be flat and boring. An instructor can seem more approachable and helpful when s/he makes the students know that they are dealing with a real and caring human being. The tedium of writing or grading a test can be made infinitely more tolerable by having in mind the students that one is serving. Preparing lecture notes can be inspired by a desire to help the students to understand the material. Simply pointing out that a problem is fun can bring a contagious sense of excitement. Students benefit from feeling loved and knowing that the instructor loves the material.

A love of math and of the students brings a desire to make the material and class as well understood as possible. A clear syllabus with easy-to-understand policies and expectations gives the students a sense of security and a feeling of trust as an instructor outlines the rules in which s/he operates. Open, generous and well-advertised office hours give the students an opportunity to meet the instructor in a more personal setting and have the material explained to them in a way tailored to them. I tend to have an open-door policy, where a student can ask a quick question outside of office hours if they find me in the office. This policy is rarely abused by the students, and if I am too busy to answer many questions I have no problem letting them know. Doing this makes them even more grateful for the extra time that I give them, since they know that I have other things going on. Clear policies protect the instructor as well as the students. In addition, math is a subject which many students in the United States learn to love or to hate in high school, and the latter emotion is far more frequent than it should be. I have met with many people who thought that the subject was fun up until a certain point, and then they encountered an instructor who made math hard for them some way or another. This can come from the subject being taught in a muddled, unclear

way. Once a student thinks math is hard, it is hard to convince them otherwise. I like to be a proselytizer for the love of math by breaking a student's previous black boxes. Let me explain what I mean by this. As a student learns material in math, there is an opportunity to understand the material that is presented, and there is an opportunity for the student to memorize a mechanism that seems to work for a problem, and to put the explanation in a black box that they never touch again. It is simultaneously amazing, alarming, and fun to show a student why a rule or a mechanism works. This is the type of learning that lingers in the brain. It is especially rewarding to hear a student say, Oh, that makes so much sense now! I wish I had seen it that way before! I try to come up with good explanations which are as complete as a student is prepared to receive.

Nobody likes to feel they are being treated unfairly. On the other hand, students love to feel like they are catching a legitimate break. Balancing a sense of fairness to all students with a desire to cut a break can be difficult. As mentioned earlier, a clear syllabus should help to avoid most problems, but extreme contingencies will happen, such as an extended illness. Presenting a solution to a contingency and asking the student what they think about it helps them to feel respected and to know that their input is respected. Even if the student does not agree with the outcome, the instructor is respecting the student's input. A sense of fairness affects how an instructor grades. Grading is rarely a fun experience, and can be made longer by trying to be extra careful and fair. This, I feel, is something that the instructor owes to the students. Credibility can be quickly lost if a student senses arbitrariness in point assignment or if the student sees inconsistencies with how his neighbors' work was graded. Fairness also requires an instructor to make sure that the class is of comparable difficulty when compared to other sections.

I have been on both sides of over- and under-preparing. I have sometimes taught class underprepared, with little thought given to how to best present a topic. Sometimes I have hastily scribbled down a few lecture notes and stumbled through a

lecture. For the vast majority of the time, however, I have tried hard to give students the type of lecture that they deserve. The first class that I instructed was trigonometry. I prepped lecture notes and stuck very carefully to them, but the presentation was wooden. I didn't bring the concepts and examples to life. I wasn't very fluid in my teaching style. About a year later, I was given a calculus class to teach. This time I took a different approach. I prepped lecture notes well in advance. I thought long about what sorts of analogies and examples would be most interesting. I motivated the students by letting them come up to the board as we reviewed for a test. I held extra office hours and looked for ways for students to get involved with the discussion. I would do a parlor trick by having a student come up to the board and try to violate the Intermediate Value Theorem. This type of instruction is fun. Being so prepared that you can mostly go off the top of your head, occasionally glancing at lecture notes, allows more freedom in the classroom to interact, make jokes and enjoy the experience. Over-preparation is really just the right amount of preparation.

Over-preparation brings us to the last point- exciting the students. Math is theoretically an easy discipline to sell. There are so many applications of even basic calculus and algebra. When students learn how powerful they are becoming as they learn a few basic principles in calculus, they tend to get excited. When a student really understands what a derivative is, beyond symbol manipulation, they feel intelligent. There is power in mathematics. The ability to think in precise, logical ways is rewarded both in and outside of the academic setting. The ideas behind the abstractions of math have an intrinsic beauty, and help to discipline and organize the mind.

These principles are a summary of my still evolving philosophy of teaching. My experience in teaching has been both rewarding and instructive. It is often humbling and exciting, sometimes nerve wracking or grinding. Whatever else it has done, teaching has taught me to be a more dynamic learner and presenter. It has taught me to love in the teacher/student relationship. It has helped me to seek

a greater transparency in my understanding of math and desire to be understood. It has reinforced a sense of fairness. It has taught me to invite others to revel in the beauty that is mathematics.