

Teaching Statement

Eric J. Landquist

Math is fun. Math is useful. Math is cool. Math is interesting. Most people would disagree with those statements, but I believe that one of my roles as a teacher is to change those misconceptions. My aim is for students to understand the conceptual meaning and importance of what they learn, and realize the relevance of course material, applying it to their careers and everyday life. There are several strategies that I use to achieve these goals. I first like to set a casual and positive atmosphere in the class, but do make it clear that hard work will be necessary. At the same time, I make no effort to hide my enthusiasm for mathematics in general and the course in particular. In the classroom itself, I like to use a variety of methods for presenting material to suit various learning preferences, but in the end I want students to engage the material and take ownership of it. Finally, as a teacher I have learned that the best way to learn something is to teach it. So to solidify the mathematics in their minds, I like to have students explain concepts to each other and to me as well. When a student reaches this point, I am confident that they are in a position to use the mathematics in their own area of study. There are several methods that I have employed at each of these steps, and many are in development as I seek to determine what serves the students best.

The first minutes of a class set the tone for the remainder of the period, and the first day sets the tone for the whole semester. In recent semesters, I have shaken hands with every student on the first day, personally introducing myself, and like to greet them at the start of class. I believe students are more comfortable with a teacher when they feel like the teacher is on their side rather than an adversary that is poised to mark them off for incorrect answers. Of course wrong answers must be marked wrong, but this semester I decided to put an idea into practice to show my students that I want them to succeed. I made an optional homework assignment in which I asked the students to rework incorrect exam problems, stressing that I wanted them to understand foundational material before moving on to more difficult topics. To my amazement, nobody dropped the class after the first exam, but on top of that, some of the weaker students approached me asking for advice on how to prepare better for the next exam and in general how to do better in the course. In addition to these newer ideas, I have always sought to make myself available to students and to convey to them that I am happy to be a resource. I make it a point to set up convenient office hours, and in the weeks before an exam, provide practice exams, hold review sessions, and schedule extra office hours. From day one, I create a friendly and supportive environment in the classroom. By setting this kind of tone for the class, it is easier for the students and I to develop a good rapport.

To fuel the positive atmosphere, I aim to make my enthusiasm for mathematics infectious. One point a supervisor of mine made during an orientation was that there is a strong link between student learning and the teacher's enthusiasm. The main tactics I use in this area are humor and storytelling, although I do often interject with comments highlighting an interesting item. I have a fairly broad and extensive cache of mathematical humor and stories, which I like to apply when they fit in with the lecture, or when I simply want to get everyone's attention at the very beginning of class. Whether or not students like this mathematical humor, class time invariably becomes more lively. Along those same lines, explaining some of the history of mathematics puts a personal touch on many of the concepts

and provides the motivation for the development of certain areas of mathematics. Everyone likes to hear a story, and these stories can make course material come to life.

Furthermore, showing why certain concepts were developed and how they apply shows students the relevance of course material to the real world and to their career goals. When I can, I therefore incorporate these applications into lectures or mention them in conversation. It is one thing to say the material is important to learn, but it is even better to show them why. Most students that I have had are engineers, and engineers in particular want to know why they should care about what is being taught. This is my way of reaching those with that type of curiosity. For cases in which there is no immediate application, it helps to remind the students where the course is going and briefly mention how we will be building on current material to develop later concepts.

While I wish to engage the students, I ultimately want them to engage the mathematics themselves and with others. Lectures are important for giving students at least initial exposure to certain concepts, but they rarely grant deeper comprehension. Group work is one method to build on lectures, so in a statistics course this summer, I began having students work on problems together in small groups. I was then able to oversee the students' progress and see the proverbial lightbulb go on in a less intimidating setting. Another approach to accomplish this is through the proper use of technology, which ideally is also done in a group setting. I am currently teaching multivariable calculus with Mathematica, which is an excellent tool for learning such a visually-oriented subject matter in my opinion. I believe that for most people many concepts can be understood better and intuition can be developed more quickly with the use of technology because these programs allow students to observe an abstract object as a concrete image, bringing the material to life. Ideally students will not simply go through the motions of working through a problem, but will develop a curiosity about certain aspects related to the material. When a student gets to that point in his study, the momentum will carry him through the rest of the course and beyond, so I often make suggestions to lead a student to that point. When a student has begun to engage the course material, it is natural to then show his peers how to approach certain problems, so I am making more of an effort now to have students explain problems to each other. This is another advantage of group work, since it allows students to learn by teaching.

I should also note a pair of recent influences in my teaching philosophy. The first is Jaime Escalante, whose story is told in the movie *Stand and Deliver*, and the other is a feminist perspective, which my wife did some research on for a class project. Both influences emphasize the importance of group work and community, so these were major factors in my desire to engage in more group work. Furthermore, there is an increasing percentage of students whose cultural background is very much community-centered. While the modern education system is largely individualistic, and many do well in such a system, it will benefit many others to create a more communal environment more suited to their cultural and personal ways of thinking and interacting.

In summary, I love what I do, and by making myself available to my students, I show them that I care about their success. I want my enthusiasm to rub off to the point where students can't wait to come to class and take what they learn into every day life. I am still learning how to teach better and still experimenting with different ideas, but the ultimate purpose of these methods is to encourage students to teach so they can learn better. In so doing, my students will be equipped to apply mathematics in whatever field they pursue in life.