

Teaching Statement

Andrew Starnes

Learning mathematics is best accomplished by doing mathematics. Too often students spend class time watching instructors do mathematics which results in students only doing math at home or on tests. Students benefit by practicing mathematics when they have a guide to help them. In addition to improving students' problem solving skills, the classroom is the ideal place for students to build academic communication skills and to take ownership of their learning. I employ these practices in my classroom by building relationships with students, assisting my students in forming connections with their peers, encouraging students to explain their reasoning, and by creating a safe space in which to do mathematics.

In order to build relationships with my students, I talk to them about their interests and lives. I accomplish this by arriving to each class at least five minutes before it begins. Often I will have questions related to what we will talk about that day. For example, when we cover the Intermediate Value Theorem, I will ask "if there are 1000 people in a theater, was there a time when there were exactly 500 people in the theater?" This leads to an intuitive discussion about continuity and encourages student communication. My classroom is very interactive and I am always looking for ways to get students more engaged. Another example of such engagement is when I teach monotonicity, concavity, and curve sketching I will only spend a day or two teaching the concepts and then a week or more of class having students practice these skills with each other in class.

Students tend to participate more when they have a chance to work with each other. Before the semester starts, I assign students to groups. Groups are extremely valuable, so the majority of the first day of class is spent working in these groups. This sets the tone for the semester and all of the students now have companions that they will travel the course with. One way I reinforce my group structure is by assigning group homework early in the semester. This encourages the groups to meet together outside of class as well. I also ask groups to present problems that they have worked on together. If a group did not complete the problem because they got stuck, then I ask the other groups to help. This allows the other groups to fulfill a teaching role, which complements my teaching philosophy that students should take a more active role in their learning.

When my students work in groups, I walk around and ask them about their answers even if they are correct. I want them to explain to me why they did what they did. The reasoning behind an answer is almost always more important than the answer itself. On tests, I ask conceptual questions that do not always have a unique correct answer. When students ask me if their answer is correct, I will say "maybe, what do you think?" The first few times, this question is met with a sigh, but I remind them how important justification is and encourage them to explain. After the first day or two of class, they explain their reasoning without any prompting from me. Sometimes students get stuck while working on a problem and they will ask me to help them. Instead of directly answering their question, I will suggest that they ask their group mates. My goal in the classroom is to have students engaged in discussion with each other and me, not just on a quest for a correct answer.

In order to facilitate discussion in the classroom, I create an open and safe environment. I want students to ask questions and answer questions. Every student is different, so I explain things in multiple ways. Sometimes this means doing a computation and looking at a graph. Other times it means doing a variety of different algebra steps. Since students need to critically think about what we are doing and not just watch me do it, I encourage students to answer each others' questions. For example, in one of my classes the students were so willing to answer each others' questions that I often did not have to say anything! Also, when doing a problem I will always ask the students to tell me the next step. I write down whatever the students say, whether it is right or wrong. This is followed by "does everyone agree?" Even when they have made an incorrect step, I will encourage them, because the purpose is to learn the process, not just know the correct answers. The ability to have open discussion in class means that I need to create structure both in and out of the classroom.

Organization is very important to me as a teacher. I use a document camera while teaching so that I can scan and post online the notes we take in class for the students to reference. I also post quiz and test solutions so that students have a guide to correct solutions and explanations. I created note taking guides for Calculus 1 that the students print before class. One huge benefit of the note taking guides is that more time is spent working on problems rather than copying them. Academic feedback is another crucial piece in a well structured class. I try to get quizzes and tests graded and handed back within two days, so that the material is still fresh on their minds. They can see their mistakes and fix them before too much time has passed and the incorrect ideas are cemented in their minds.

Just as feedback and reflection is important for students, it is also important for me as a teacher. Over time, my teaching philosophy has changed. The first class I taught was a terminal math class for many students. After a few days of lecturing, I saw that I was not getting through to them and needed to change my tactics. I decided to try having them work through problems in groups, and then as a class discuss any problem they wanted to. This engaged the students on a level that my lectures could not. When I started teaching calculus, my teaching evolved yet again. I had the opportunity to be part of a teaching mentorship program. Through this, I started asking different questions than I had before. Teaching is an art and the more skilled I become, the more my students can learn.

In conclusion, teaching is all about relationships and engagement. To accomplish these two things I focus on three things. First is my relationship with my students. This relationship is built upon a common ground. Students know that I have an investment in them beyond just the content I teach them. Second, in my classes students spend a significant amount of class time interacting and grappling concepts with their peer groups. This creates camaraderie and a sense of ownership among the students. Third, as a class I want students to feel comfortable expressing themselves. An open and inviting classroom is the cornerstone of my effectiveness as a teacher. Finally, since I provide access to materials outside of class, students do not need to worry about in class structure and focus on content they are experiencing. Over time I want to continue to grow as a teacher and become the best that I can be so that my students can also achieve their best.