

SCOTT SCHNEIDER: TEACHING STATEMENT

I have been teaching mathematics ever since my friends began having trouble with algebra in the seventh grade, and I enjoy it as much today as I did then. I have had time to improve my technique a bit in the intervening years, but the tutor in me remains firmly in place. I still believe that the best context for learning mathematics is unhurried conversation rather than lecture, preferably with an involved and trusted acquaintance instead of an anonymous and distant instructor. My teaching style is the result of attempting to reconcile these beliefs with the demands of the lecture hall.

I have taught five undergraduate courses and one graduate course in my first post-doctoral position as an Assistant Professor at Wesleyan University. Previously I taught ten courses at Rutgers, six as primary instructor and four as a teaching assistant. My duties have included preparing and delivering lectures, leading recitation sections, assigning and grading homework, writing and grading quizzes and exams, holding office hours and review sessions, selecting course textbooks, and assigning final grades. In 2005 I served as head TA for summer math courses at Rutgers, acting as a resource for other instructors and observing their classes. Twice I have been involved in mentoring programs with undergraduates, including the Directed Reading Program and the summer REU at Rutgers. I also have extensive tutoring experience in courses from basic algebra to advanced calculus, and at the University of Wisconsin-Madison I worked at the walk-in tutoring lab and as a grader for an undergraduate course.

From my experiences I know that teaching is a difficult task requiring preparation, focus, energy, and strong organization and communication skills. I believe that successfully teaching mathematics to a group of college students requires consistent excellence in at least two contexts. One is the lecture hall, where a teacher must attempt to engage all students at once on topics they may find dry and confusing. Each student brings to class his or her own past knowledge, learning style, and natural ability, to say nothing of mood, personal issues, and dispositions towards the material and teacher. This can make lecturing to a large group an absurd task. The ideal lecturer will be part rigorous mathematician, part cognitive psychologist, and part theatrical entertainer, all at once and in real time — surely no small feat! But the likelihood of success greatly improves, in my opinion, through attention to a second critical context in which teaching takes place: personal interactions with students. For some students this may mean time spent at the end of class or in office hours; for others it may simply mean knowing names, strengths and weaknesses, past performance, and an occasional timely remark indicating this knowledge. But I believe it essential for students to be treated as more than simply one of many, a consumer of this strange product, the math lecture.

At the end of each semester I ask myself the following questions about any courses I taught. Have I done all I could to get my students to care about the class? Have I done all I could to facilitate open, comfortable, effective communication with and among my students? Have I done all I could to present the material in the clearest, most accessible, most professional way possible?

Indeed, the essential starting point is getting my students to care. About math, about their performance, about their grades, about their academic relationships with their peers or with me — anything that will get them to want to come to class and engage the material and try to learn. Ideally they will care about the math, but sometimes this can be too much to expect in a required course. Initially as a student and now as teacher, I have learned that when it comes to mathematics, success is an indispensable ingredient in caring. Failure to understand math is as frustrating as success can be rewarding and empowering. So it is essential to find, for every student, some initial foundation of understanding, to recognize and praise this

understanding, and in general to challenge students in roughly equal portions with material that is to some extent already understood and material that will expand their knowledge. I also try to inspire interest by giving students opportunities to be responsible for each other. I frequently incorporate group work into my syllabus, and at all times encourage students to teach and learn from each other as peers. Finally, I try to use the natural energy I bring to teaching in order to engage my students on a direct and personal level and to display at all times how much *I* care myself. Intensity and enthusiasm are contagious. To many a precalc student math is likely already boring enough, and does not require further assistance from the instructor. If *I* do not look like I want to be there, why would they? I therefore try to spice up lectures and have some fun. I also try to connect personally with students in an effort to cement their interest in the class, and, hopefully, in the mathematics itself.

The worst criticism I could imagine receiving as a teacher is that of unapproachability. My highest priority in teaching is to establish strong channels of communication with my students. Learning *must* be interactive; a class with no questions is a class that is probably not learning much. I also want students to feel welcome discussing material after class, or in office hours, where more personal attention is possible. I feel that one of my strongest qualities as a teacher is my ability to develop meaningful relationships with my students that induce them to care about the course more than they otherwise would, and allow me to teach in a way that is tailored to their specific background and needs. I have connected with many students who otherwise would have had no interest in math or in the course aside from their grades. Students work harder when they find that they are not anonymous.

But no amount of theater, personal attention, or open communication can replace the need for a clear, organized, and professional presentation of the material. Preparation is essential; the ability to explain something informally and extemporaneously is useful, but apart from answering questions, or the rare aside, a classroom lecture is not the place for “winging it.” I write my lectures ahead of time in a style that will both facilitate in-class learning and repay later study when students revisit their notes. I have consciously borrowed some techniques from other teachers that I found especially effective. For instance, I am a strong believer in verbal repetition of important facts and themes throughout a semester. My experience is that it can be difficult to remember what is said only once; but hearing something two or three times in different contexts flags it as important, and with subsequent repetition students begin to anticipate what is about to be said in a way that seems to dramatically reinforce learning. Indeed it seems the best situation a math student can be in is to know the answer, or to be able to complete the teacher’s next sentence with, say, 70% confidence — and then to have that knowledge confirmed by hearing it once again, as a repeated theme. Understanding mathematics is not an all-or-nothing affair; the learning curve is steepest where repetition reinforces partial understanding, and at worst students will just gain confidence from hearing again what is already known.

And such confidence should not be treated lightly in a math student. Math is *hard*, and acutely less enjoyable when it makes no sense. I try to keep this in mind whenever I teach. For every one of us, mathematicians included, there is some piece of mathematics that lies beyond our easy grasp and may make us feel slow and incompetent. When I see someone struggling with a concept familiar to me, I recall my own difficulties learning it for the first time, or I think of the frustrations I experience with my own research. It may be the tenth time I am teaching it, but it is likely to be their first time learning it, and I try never to forget that.