

# Teaching Statement

## BEN WEBSTER

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Teaching has been important to me since long before I became a mathematician. While my first formal classroom teaching was during graduate school, ever since I started learning facts, I've wanted to share them with other people, if my mother is to be believed. As I learn more and more beautiful mathematics, the more important it seems to help other people see that beauty. While teaching, just like research, has its own frustrations, all math, whether it be calculus or cutting-edge research loses its meaning if it is not shared. Therefore, while I've concentrated more on research thus far in my career, I think success as a teacher is an essential complement to success as a researcher.

Also, I think teaching is something I can rightly be proud of. I may not have gotten any teaching awards, but it's was more gratifying to get a handmade card from a student I had helped several times in office hours, or see my students out-perform the rest of their lecture on midterms and final exams.

As an undergraduate, I chose to go to a smaller liberal arts college, focused on teaching, and I have never regretted this decision. I've both personally experienced, and seen in my friends, the difference that good teaching and engaged instructors can make to the undergraduate experience. Being successful, in mathematics or in the broader world depends on interacting with others, problem solving, and bringing your own ideas to the table; in short, being active, not passive. I hope to be able to my own small part to replicate this at a larger university like Oregon.

Of course, my classroom teaching experience thus far has been as a post-doctoral instructor at MIT, and as a graduate student instructor at Berkeley. Each semester I was teaching, I spent a total of 4 to 6 hours a week in the classroom with two sections of 20–25 students each as a complement to an equal amount of lecture with a professor, as well as 2 hours a week of office hours. Some semesters, I wrote and graded weekly quizzes, and graded selected homework problems and exams.

The class time was a mixture of group work and going over problems from the book, worksheets or previous homeworks as a class, depending on the material, the facilities (some classes had enough blackboard space for group work at blackboards, some didn't) and the disposition of the class (independent

group work just doesn't go as well at 8 a.m. as it does at 11 a.m.). Whatever the format, I made my first priority to have an interactive class. After all, the students had plenty of lecture to passively listen to the material of the course; in section, I wanted them to use the concepts of the course themselves, with me being there to keep things on track. It takes them a little while, but the students start participating when they figure out that I'm not going to answer the question I just asked myself. This was particularly effective after the first couple of weeks, when I had learned all the students' names and could ask individuals for the next step in a problem.

Obviously, one has to use a different technique when teaching a class which requires more lecturing, but I don't think that means giving up entirely on interaction, especially in a smaller class with more advanced students. I've had a lot of experience with this from the student side of the equation, and hope I can bring the same vitality to the classroom I've sometimes seen as a student.

I also have experience with activities I consider to be teaching outside the classroom. After all, calculus students are an important audience for mathematics, but they're far from the only one:

As an undergraduate, I worked as a tutor for other students not just in math, but also physics, writing and Spanish through the tutoring center at Simon's Rock. I'm given many talks, ranging from speaking on my own research at conferences to informal expository talks in student-run seminars.

For a year, I both co-organized and occasionally spoke in a weekly seminar for graduate student speakers called "Many Cheerful Facts" which was focused on talks accessible to first-year graduate students.

I've also made an effort, since graduating, to do math with graduate students (one might think that this would be difficult while at the Institute for Advanced Study, but I actually had a visiting graduate student living with me during that time).

In all of these contexts, I've found that the most important thing is trying to see your topic through the eyes of your audience, whether that means pitching a talk differently to representation theorists than to topologists or trying to see the world of math through the eyes of a calculus student. Throughout, one has to strike a balance between seeing the next rung on the ladder of understanding your students can reach, and accepting and working around their limitations. When they needed it, I've worked very hard to teach calculus students induction and succeeded with much of my class, but have learned the hard way that most of them will never be able to derive trigonometric identities on the fly.

Teaching well is a lot of work, but for me, it's at as much a part of what I do as a mathematician as my research, and I look forward to the opportunity to do it for many years to come on all different levels.