

## Teaching Statement Elizabeth Wilcox

As a graduate student first at the University of Vermont and then at Binghamton University, I have taught classes for students who will never again take a math course as well as classes for math majors. With few exceptions, I have been developing a syllabus, preparing my lectures, designing and grading assignments from the start of my graduate experience. Through my experiences I have grown greatly as a teacher and have developed a teaching style focusing on a short mantra: encourage, engage, and enjoy.

Encouragement of my students takes many forms. To make the classroom welcoming, I make a point of being as approachable as possible. I encourage questions, but also reiterate phrases like “Come to office hours! If you can’t make it, let’s make an appointment.” and “If you’re nervous about asking a question in class, send me an email or ask me before class.” I make sure students are aware of the different avenues to my doorstep.

One thing I do to encourage my students in their studies is include step-by-step instructions for types of problems when I can, and try to break problems down into immediate goals to be met. I tell my classes that you have to know what you want in order to figure out how to get it. Devising “problem outlines” teaches students not how to do one specific problem, but how to work on problems of specific natures and provides an overall approach method.

Practice of the concepts and steps is a requirement for learning. In class I present as many examples as I can while highlighting how the approach outline works despite the differences in the specific examples. An approach cannot be rigid, so to stress flexibility I also give examples where the outline has to be modified and examples where it just won’t work.

Students ultimately are responsible for their own learning—I can encourage but not make students study and learn. Yet it’s so tempting for inexperienced students to let suggested homework slide all semester long until the week of an exam. To counteract this I usually assign required homework and have frequent in-class quizzes, especially for my fall semester classes. It means a lot of grading, and groans from students, but required homework forces students to keep up with the lecture. Additionally the grade for an advanced math class oftentimes is largely based on homework performance since in-class quizzes become less effective at judging understanding at this level. Thus most of my students learn to live with assigned homework on a regular basis.

Encouraging students to learn is important, but if the class isn’t engaged then no amount of encouragement will lead to learning. I actively look for ways to involve the students during class. With introductory math classes, part of each week is spent getting students up to the board working on problems. I also make worksheets to let students talk about the exercises with each other and me during class. This is not always reasonable for an upper level course where the material is more abstract and less hands on. However, in those classes discussions of the material are more easily worked in—it’s hard to discuss how to take a derivative but how to prove that process works is an entirely different matter.

In all of my classes I either look for engaging activities or develop them myself. For my proof writing class I developed two workshops to help students start to think about how to write mathematics formally. The first workshop involves a reading which gives guidelines for good mathematical style. Students discuss the reading and why the guidelines are important, looking for examples within their own work. The second workshop involves writing a proof and swapping with another classmate. The goal is to write a clear proof so that the classmate can tell what was supposed to be proved and at the very least read the proof without knowing ahead of time what the theorem states.

I understand that many students, especially in the introductory math classes, aren’t excited by math. I create examples to which students might be able to relate or in which students might be interested. For statistics classes I use epidemiology examples as well as data from surveys and political polls. I like to bring relevant topics from math history into courses to give context and motivation. For one class I gave my students the opportunity to demonstrate their non-math skills and interests by assigning a presentation and paper project.

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Listening to students talk about the connections between art and mathematics or music and mathematics after spending a semester trying to convince them that math really does exist outside classrooms and checkbooks was inspiring. These projects truly seem to reach out to students who otherwise might not find a place for mathematics in their lives.

The third part of my mantra, enjoy, is what brings everything together. I love mathematics—the challenges and the beauty – and if I didn't enjoy math myself then I couldn't teach my students how to appreciate math. I also love teaching. I love the thought of handing down knowledge and leading students on to bright futures. This definitely comes across in my classroom demeanor—I smile and laugh during class and so do my students. Halfway through the term, students tend to run out of energy. It gets hard to keep their attention through a lecture and I resort to telling bad math jokes or having students stand and take a moment to greet their neighbors. Techniques like these definitely earn some smiles and a few head shakes, but if I just trudged into class without a sense of humor then my students would feel no motivation not to do the same.

Also, because I enjoy my work I make an effort to improve my performance with each semester. Some student suggestions have involved not talking as fast and announcing quiz and homework averages. As a native of New York state, I do talk fast and I began making a conscious effort speak slower during class and in seminars. I warn my students that when I get excited, I'm bound to start talking fast – so don't hesitate to raise a hand and ask me to start over and go slower. I make it clear that I won't be offended, and I really do try to go slower in the first place. I also have learned how to post class materials, assignments, and even grades to the university's secure online program. I never thought about announcing averages to the class but when one student wrote that suggestion, I began making an effort to announce averages as each graded assignment is returned and post that information online. Teaching is a great joy for me, and I appreciate every opportunity to become more effective in my teaching.

Encourage, engage, and enjoy—it does not matter what level students I am teaching, every class is an opportunity to express this mantra and every class is a chance to bring my love of mathematics to students who might otherwise not appreciate the beauty behind the symbols.