

TEACHING STATEMENT

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My teaching experience consists of varying levels of responsibility with undergraduate courses at the University of Minnesota Twin Cities while I was a graduate student. The last few years I have spent in research postdocs without teaching duties, but I would very much value teaching going forward.

PROMOTING STUDENT GROWTH

Skill-Appropriate Challenges

As a student myself, I always appreciated being challenged by my teachers, and I try to provide the joy of tackling hard problems to my students.

It was a valuable experience for me to work with two students in a directed reading program (DRP), and understand their mathematical background from an R1 university and what they were ready to tackle as a senior. One student was very capable of self-motivating to read the textbook sections and attempt the exercises. So, I needed to provide him with pushes to read the main chapters of Vakil even though he had not understood the technical preliminary material perfectly, and to complete the exercises using more advanced strategies than he was accustomed. This mentoring experience was rewarding to learn how best to support a student already at a high level. With my other DRP student, my role as mentor was mostly to suggest an appropriate level textbook, which provided many concrete examples.

As a supervisor of dozens of undergraduate TAs, part of my job was to delegate tasks. On a few occasions I gave opportunities to TAs to explain solutions to the lecture class. I have generally seen TAs raising above and beyond expectations. But I keep in mind the times TAs have been stretched too far, resulting in mistakes and stress for students and staff.

While I was an undergrad, I sat on the university committee for undergraduate research as the student representative. The committee discussed how to promote “transformative experiences” for undergrads during research projects, for which “disorientation” was expected. Having this philosophy in mind, I have tried to present challenges to students which I believe they are ready for, and if they struggle or don’t believe in themselves, support them through that discomfort. I can’t claim any of my challenges for students have been transformative to them so far, but I hope to use this strategy when guiding research projects in the future.

Mastery Learning and Revision

With mastery learning, instructors are asked to provide corrections without grades to student work, and students are allowed to submit work until they have demonstrated mastery of a concept. This puts the focus on learning, and eliminates worries about grade calculations. Having this revise and resubmit policy on at least one type of assignment per course promotes the growth mindset to a great degree.

In my experience teaching hybrid PreCalculus, all homework on the course website (MOLS) and eight in-person quizzes were mastery. Together, these assignments allow students to work at their own pace on basic computational skills. I have seen how this allows quick students to be easily satisfied, while struggling students can receive as much help as needed to fix their errors and gain competency.

Traditional end-of-semester exams serve as a nice compliment to mastery assignments. If students feel they had gained mastery with assignments, they are more confident going into the exam. Whereas if a student cheated their way through the mastery assignments, or otherwise failed to retain the skills taught in class, that lack of knowledge shows up on the end-of-year exam.

Low-Stakes Failure

Allowing revision is one type of opportunity for low-stakes failure. Other forms which I have used include think-pair-share, rotating or random in-class questions, anonymous polls, low-point daily quizzes, and in-class problem solving sessions.

Some of these teaching methods are disliked by students, in fact, I have had students who explicitly had the accommodation to not be called on during class due to anxiety. From when I was a student myself, I did not appreciate being asked to answer questions I did not know the answer to. However, I agree with the educational philosophy that having students “fail” at small tasks promotes a culture of improvement.

In a recent discussion I had about why flipped classrooms do not always achieve improved learning, it became clear to me that proper implementation is crucial. Many young people simply don't have the executive functioning skills to navigate college courses without deadlines or clear paths on how to gain knowledge. This was largely my experience teaching freshman in hybrid PreCalculus. Particularly when experimenting with new instructional techniques, and for low-level math courses, including frequent checkpoints and low-stakes failure opportunities is important to build learning skills in students.

SUPPORTING STUDENTS WELL

Positive relationships

I received the [Outstanding TA award for the 2017-2018](#) year in the University of Minnesota Math department. I hope I received this award due to my students feeling valued and respected during my time as their teaching assistant.

Being a positive role model as a mathematician and sharing guidance to students via mutual respect are probably the most important parts of being a teacher. All the factors which go into building this type of relationship with students is complex, but I try to listen and communicate clearly as a minimum. From student feedback comments, I believe students see I genuinely care about their progress.

For students of minority backgrounds, finding peers and role models they can see themselves in is really key. I cannot say I understood this until my postdoc years, being an American woman in Europe and Japan and being an isolated minority myself. In this sense, making sure students find connections with other minority students and building community inclusive of the diverse mathematical strategies this brings is a priority. I hope to share how I have struggled with this isolation myself, when appropriate.

Math as a Learnable Skill

The intimidation students feel from math is very real. When I have felt intimidated myself with a problem, sometimes the only thing that kept me going was my teachers having faith that I can find a solution.

Two of the strategies I take is to help students breakdown problems into small tasks, and to encourage students to persevere trying ideas until they see some progress. I remember one active-learning class where I had particularly emphasized persevering at problems, and which resulted in two women students working on a problem on the board for almost the whole class. Sometimes just encouraging such students to be more assertive and energetic with the problem at hand goes a long way.

As mathematicians, we think we are good at being precise with details. The idea that problems can be broken down into simple pieces is part of the beauty of math, and this message has unfortunately not reached many students. When I work out examples in class, I try to be very explicit and also explain the strategy. But it is more rewarding when students can be guided to find how to breakdown problems themselves.

LISTENING TO FEEDBACK

Reflecting on negative end-of-year student feedback has helped me improve and form my teaching philosophy stated here. For example, I have worked on slowing down the pace of material, being more approachable, and being better with time management.

For me, it has been valuable to start to understand which complaints need fixing, and which complaints are part of the learning process. Learning as a student is not easy, and I hope I can guide students through that stressful process by creating a supportive yet challenging classroom environment.

Equally valuable has been the positive feedback from students. Hearing that they really appreciated my enthusiasm with the mathematical content, or that they appreciate my help outside of class is wonderful.

In any future courses I teach, I would provide an easy way for students to submit feedback and let them know I take their opinions seriously. Of course, the expectations of colleagues are important as well, and I hope I can be supportive of other mathematics instructors in helping them improve.