Mathematics is an inspiring and beautiful subject, the mastery of which is a demanding task. Effectively communicating mathematical ideas can be an even more formidable undertaking. While researchers may be less anxious than students when confronted with unfamiliar mathematical concepts, a pervasive social fear of lagging behind one’s peers remains in either setting. Before imposing any meaningful expectations on learning, it is crucial to make the classroom a place where the student feels comfortable to grapple with concepts and voice confusion.

My practices have been very well received by my students as evidenced by my teaching awards and high ratings on student evaluations. In 2011, I was awarded a campus-wide teaching award at the University of Wisconsin - Madison. As an undergraduate at the University of Illinois at Urbana-Champaign I was awarded the Honors Teaching Assistantship for undergraduates, taught a recitation section of Calculus II, and was included on the campus-wide list of teachers rated excellent by their students. One student wrote the following in a nominating letter for the Honored Instructor award at the University of Wisconsin Madison.

Jo seriously has it going on. When I’m confused while sitting in lecture I always remind myself that Jo is my TA. My friends who don’t have Jo are jealous of how much effort she puts in compared to other TA’s. She goes out of her way to email us with extra help, she gives us worksheets to check our understanding, she holds extra office hours, and you can feel her excitement for math come out during class. Jo is the reason for my success!

I am very touched to have made an impact on my students and continue to strive to inspire them to further their understanding of mathematics. My teaching strategies are built around ensuring accessibility, demonstrating a clear commitment to students, alleviating student frustration, and providing meaningful feedback.

**Accessibility.** It is important to ensure that the mathematics being presented is as accessible as possible. I strive to create an environment in which students feel free to ask questions, which enables them to take an active role in their learning. To encourage discussion in the classroom I frequently pause while working through a problem to point out places where confusion might arise. This gives students the chance to ask questions and absorb the material. When responding to questions, care must be taken to avoid making a student feel embarrassed or singled out. I also follow up with students after my explanation to ensure that others have understood the question and answer before continuing. When lecturing, I provide context for the material by connecting new and previously learned concepts. This enables students to realize that mathematics is more than the superficial mastery of a technique and come to a deeper understanding of the subject.

**Commitment to Students.** An instructor needs to remain receptive to students and demonstrate a clear commitment to their learning. With moderate encouragement and good rapport I have even managed to make students in my large calculus lecture comfortable voicing their difficulties with concepts being covered. This engages my entire class in a discussion and allows me to better tailor my lectures to the needs of my students. I have found incorporating humor and mnemonic devices has been helpful in making my students feel more relaxed. In cultivating such an atmosphere, it is imperative to convey enthusiasm for the subject and, when appropriate, connect abstract ideas with real world applications.

**Alleviating Student Frustration.** It is crucial to not hopelessly frustrate students by obfuscating ideas with dense mathematical jargon. In particular, it is paramount to help the students understand how to break down problems into manageable pieces. I am still able to challenge students with worksheets containing harder problems, which I encourage them to work on these during class in groups. This allows students to struggle a bit on their own while also giving them access
to the instructor. In larger lecture settings, I have found tools like Piazza to be in disseminating help with difficult problems.

Another means of alleviating student frustration is to explicitly state the expectations for homework, quizzes, and exams. The level of difficulty of questions on exams and homework should be varied to ensure a fuller understanding of a concept. Exam questions should be comparable to homework problems so that students will see their hard work during the semester pay off. In addition to preparing sample problems I have additional office hours in the weeks leading up to an exam to encourage students to begin studying earlier.

Meaningful Feedback. Teaching mathematics goes beyond helping students master concepts and problem solving techniques. I also assist them in developing their abilities to write mathematics in a clear and concise manner. This crucial skill takes time to develop and becomes especially necessary for students as they progress to higher levels of mathematics. When instructing students I take pains to ensure that my board work is neat, organized, and in complete sentences. This further helps students realize that math is not just a long string of equations or a set of disjoint concepts.

In addition to having edited REU papers and teaching students the rudiments of mathematical proofs as part of the Honors Calculus sequence, I have graded for a wide range of courses ranging from undergraduate analysis and topology to graduate courses in differential geometry and algebraic topology. My experience has shown that all students, from undergraduate freshman to graduate students, benefit from constructive feedback regarding the organization of their work and samples of good mathematical writing. Grading should be consistent and fair, with partial credit given so as to not discourage students. When I meet with my TAs before the beginning of the semester I make it a point to discuss my philosophy towards grading.

While I am continually improving upon my teaching, these strategies have ensured that my students are engaged in my classes and enjoy learning mathematics.

Experience. At Columbia University I have been a lecturer for Calculus III, with more than one hundred students in my classroom. I also mentored REU programs in the summers of 2014, 2015, and 2016. These each started with a six week curriculum that I designed on differential, symplectic, and contact geometry. Two of these projects resulted in high quality preprints, one of which has been accepted for publication.

At the University of Wisconsin - Madison I was a teaching assistant for eleven semesters of Calculus, which included business calculus, precalculus mixed with calculus, regular calculus, and honors calculus. My duties included four recitation hours each week. I have graded geometry, topology, and analysis courses at both the undergraduate and graduate levels.

I find it rewarding to engage in outreach and mentoring programs. I have helped mentor, teach, and volunteer for a variety of mathematical activities aimed at grade schoolers to undergraduates. Most recently I have been a faculty advisor for the AWM chapter at Barnard College and Columbia University. In 2014 and 2015 I co-organized Julia Robinson math festivals in Princeton and volunteered with the Urban Assembly high schools in New York city. I have also been a mentor for the Women in Mathematics programs at the Institute for Advanced Study. In 2012, I mentored Camp Euclid, an online eight week mathematics research program for talented 6-12 graders. I also organized and designed a day long activity enabling local 3rd and 4th grade girl scouts to earn their ‘Math Whiz’ badge.