TEACHING STATEMENT

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I have always enjoyed learning, and I yearn to show others that they can enjoy it too. Better yet, prosper off it. I believe that education cannot worsen an individual, and the more educated the average human is, the better for us all. I think a good teacher is, in particular, an experienced student. Thus both my experience as a student and as a teacher inform my teaching practice.

I stand by the Hippocratic principle - *first, do no harm.* It is my first bitter lesson I taught myself on a fall day, my junior year in high school. My dear teacher, Dr. Gibbs, let me review the basics of trigonometry for both blocks of his AP Calculus class. Upon recall, it burns still. I mumbled, wrote unclear, and made little to no eye contact with the audience. Once my thirty-minute monologue ended, any pieces of understanding of trigonometry these students had, had likely vanished. The next block I taught the same material, but confusion did not arise. That day I learned the value of clarity in both exposition and speech. Although "doing no harm" does not tell what one should do, it does offer a useful perspective. Since then, every subsequent word I say, or method I choose to implement in a classroom - I ask does if it bring clarity or confusion?

Teaching would be easy had it wholly consisted of clear speech and writing. This is a necessary foundation for a good lesson, but next comes the hard part - the organization of material, selection of assessment and teaching methods, consideration of student's background and learning names etc. I think the hardest of all is convincing students that your class is worth their attention, time and energy. It ought to be clear to students, that they stand to gain something more valuable than fulfilling a credit requirement.

My first experience of teaching was College Algebra and Trigonometry during Fall of the COVID year. Teaching and seeing dark muted rectangles occasionally giving thumbs up or down, was instructive. I was instructed to cover specific chapters from a given book. But I can only tell well something that I want to tell, and where there is a will there is a way. So I spent time looking for a compromise between doing no harm, and telling my students something I wanted to tell. In the end, my notes closely aligned to the book, though with more excursions into the beautiful and the useful. Every topic we covered I tried to place in a bigger context, because the gravity of great and ambitious questions often is enough to draw curious minds in. In the end, I confess that many got lost, but some followed. Upon recall, it gladdens me still. Paraphrasing student's question - *"... so what's a graph of a complex square root map?"* - my heart skipped a beat. That made me think I've done something right. Although my teaching efforts have been recognized by our department, deep within I feel that more was possible.

Mentorship is directed and personalized teaching, where the one-to-one nature optimizes information flow. There human element becomes of greater import. When both parties are interested and committed, it is hard not to enjoy this journey. I have been fortunate to spent 6 months as a mentor to an undergraduate student Abenezer Woldesenbet, in a directed reading program at our department. Our project was based on reinforcement learning, a particularly powerful machine learning paradigm. At the end of our project, Abe gave a 20 minute presentation describing basic principles of reinforcement learning, together with a demonstration of our algorithm, which we have implemented in Python. I believe such programs have value to both undergraduate and

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graduate students, and our community as a whole. I would really like to facilitate such programs at the university of my employment.

Assessments. The empirical fact of having good grades and the subjective sense of understanding have a complicated relationship. I seek to optimize the latter. As a student, I find it difficult to learn in an uncomfortable environment. Assessments are by their nature uncomfortable, because they can appear as judgments on competence. I remind students that the grade is better seen as a tool, not a judgement. To lessen the pressure, I let students take quizzes as often as needed, on the condition their work must be perfect to pass. This way students come to quiz unprepared, so their understanding is undistorted thanks to studying the night before. Then take it again, and again, so they make every error they can. Eventually, most were able to produce perfect work, and I noted that their recall of material 2-3 weeks hence was impressive.

Structure. There is a virtue to simplicity, and getting the right level of structure is a delicate matter. As a student, at times I experienced awkward and impractical structure. In principle, one can often make a good case as to why a specific rule makes sense and how it's beneficial to students. In practice, excessive protocols only obscured the subject taught. I think class activities and worksheets ought to serve the subject, not the other way around. This is why I favor simplicity. If there is a lively discussion ablaze, I am happy to spend more time on the topic discussed, and adjust plans as needed. Of course, some structure is necessary for integrity of the presentation. I only ask to be respectful to classmates, subject and teacher. Beside the usual structural elements like worksheets, quizzes, and tests, I find value in open-ended questions. For instance, I ask students to write a paragraph describing what they learned or what was confusing during the week. Also, I found that group-work is a good way to take adavantage of the class dynamic. Specifically, when students explain content discussed to their peers they play the teacher, and so they learn what do and do not know.

Conclusion. The goal of lecture is for students to learn, that is to leave with something more than what they came in with. So I try adjust the flow of course to match diversity of students experience, educational and otherwise. I believe graduation day is not the end of learning. The general act of learning and love of knowledge is what I seek to inspire, if not in maths, then in any other avenue of study. My goal as a teacher is to foster independence, confidence and freedom in thought within the individual. As a student of teaching, I have a lot more experience to obtain. I am open to trying new methods, and seeing just how effective I can be in helping folks learn!