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Teaching Statement

Pedagogy, to me, focuses on the cause-and-effect relationship of teaching: how do my actions as an instructor affect my students' understanding? What excites me about teaching is exploring how the human element plays a role in this causal relationship. For example, figuring out how a lesson can be illuminating for one student yet murky for another. **Below I discuss my teaching experiences and explore how I adapt my teaching style to accommodate the human element of learning.** I begin by explaining how I use *critical reflection* to develop my teaching style organically. I then expand on my *personalized textbooks* which I use to create activity-focused guided notes for students. Finally, I discuss my experience teaching in Oxford's tutorial system and what I learned from their pre-learning methodologies.

Critical reflection is a strategic process of evaluating the cause and effect relationship of an event. I apply critical reflection as an instructor of record to develop and evaluate my teaching practices in the classroom. At the beginning of a course I develop a classroom strategy which I *think* will best help students engage with the curriculum. Throughout the course, I consistently gauge the effectiveness of my teaching strategy by asking myself a series of reflective questions. How am I applying my teaching practices? How are the students perceiving these practices? How are these practices affecting my students learning process? Employing consistent formative assessment through survey questions allows me to gauge student opinion and measure their understanding. For example, after working through an exercise I ask my students, "On a scale from 1 to 5 (1 being easy, let's move on; 5 being difficult, let's do another exercise) how difficult was this exercise for you? Keep your hands close to you so your answer is between you and me. Can someone share why their holding up only a few fingers?" Typically the class participates and a few students volunteer their confusion. In some cases, students articulate their feedback in a constructive way (e.g., "I don't know where the x^2 term came from."). I then go back to the students who are ready to move onto the next concept (i.e., they held up one finger in my original poll) and see if they can answer their fellow student's question. I try to engage my students in a group discussion by asking further follow up questions and adapt the lesson to ensure that students meet the learning objectives.

I also have the unique opportunity of critically reflecting on my experience as a student. I knew from a young age that I wanted to be a mathematician so I kept records of my work to help me study. I saved my classroom materials (notes, homeworks, quizzes, exams, et al.) from pre-calculus on. **Throughout my career as a student and instructor I have collated my classroom artifacts into digital survey papers. I refer to these resources as *personalized textbooks*.** As an instructor, these form an invaluable resource because I have a direct link with my experience as a student. What concepts did I struggle with? What examples did my instructor use and how did that shape or skew my understanding? What sort of feedback did I get and how did that affect my overall performance? To address these questions I annotate my personal textbooks with chapters, overviews, key ideas, and a discussion about how core concepts fit into the curriculum as a whole. I continue this practice by adapting my personal textbooks to guided notes for students.

I create space for active learning activities in the classroom by incorporating guided notes directly into my lessons. Pedagogically, these activities can be useful for students because it shifts the focus of learning from me to them. For example, think-pair-share activities allow students time to think about a particular question on their own, pair up into small groups and discuss their thoughts, then share the results of their discussion with the class. This fits in well with my guided note framework because I can allocate writing space in the guided notes (and time in the lesson) for these activities in advance. It can also be helpful for students who revisit their notes to examine their own thought process and learn from their previous work. I would also like to workshop other methods of active learning, particularly for upper-division courses. For example, breaking up the proof of a major theorem into smaller pieces then having the students assemble the proof as a puzzle-like activity.

I had the unique opportunity of being a tutorial leader at the University of Oxford. Tutorials are similar to American-style recitations in that they consist of a small group of undergraduate students who meet for one hour a week. However, the system differs in scope: students use the time to debate, discuss, and expand on the material instead of revisiting it. One cultural difference is that students are not required to enroll in the course and tutorial concurrently, in fact, students can (and sometimes do) enroll only in the tutorial. Each week, the instructor of the course assigns a reading list and essay assignment. Students have a week to compose their essays and submit them to the tutorial leader *before* the tutorial. **Tutorial essays act as a pre-reading activity which provide insights into how students processed the material and give a sense as to which topics they will bring up in discussion. My role in the tutorial is largely that of a mediator; it provides me ample time to observe students communicating, analysing, and synthesising the information.** Are the students using the language from the text or their own colloquial vocabulary in the discussion? Which concepts do they find most interesting? Are they thinking more about the theoretical or practical aspects of the concept? Based on these questions I can provide better formative feedback to prepare them for their final exams.

I think a tutorial-style methodology would be useful in a mathematics course and I would like to incorporate pre-reading activities in my guided notes. For service-learning courses, I can use my personalized textbook approach to provide students with a scaffolded exercise to work through before the lesson. The expectation being that students come to class with a pre-exposure to the information, enabling a deeper discussion of the material. There is also a unique opportunity to present them with a question (without the material) and see how they would solve it. This can be useful in various discrete mathematics courses where numerous approaches can be used to solve a problem.

The cause-and-effect relationship between instructor decision and student outcome is mediated by a human element. The challenge of adapting a lesson to accommodate students is what makes me passionate about teaching. I use critical reflection to reevaluate my teaching style and assess the effectiveness of my classroom strategies. I also create resources for students which are the culmination of my notes as a student and an instructor. These personalized textbooks are delivered to students as guided notes which allow me to create a creative space for students to engage in active learning activities. In the future, I would like to adopt elements from my experience teaching in the Oxford tutorial style and incorporate pre-learning activities for my students.