
Teaching Statement

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As an educator, my main focus is to cultivate well-rounded mathematicians who possess flexible mindsets and sustainable skills such that they may positively impact the world. Over the last eight years, I have had the opportunity to teach a variety of courses, including high-school level courses to introductory and upper-division undergraduate courses. Each course has had its unique set of learning objectives and group of students, and my experiences within each one have influenced my philosophy of teaching. While I am continually striving to refine my techniques and develop new skills to become a more effective teacher, I am looking to leverage my experience by joining faculty who inspire enthusiasm and motivation within the community.

1 Current Practices

In my earlier years of teaching, I believed that the most effective way to provide students with the fundamental tools to solve problems was to deliver organized lectures. While effective for some students, particularly those who were self-directed learners, most struggled to connect concepts with their applications. While I do still strongly believe having organized material is an important factor, I have learned that to develop a deeper understanding of the course material, students must actively engage with its content. For this reason, I strive to make class interactive by mixing lecture with opportunities for students to discover the mathematical connections themselves. I ask guiding questions to provoke student thinking and incorporate active learning strategies that allow me to engage with students as they engage with the material. For example, I integrate small activities that involve students working within groups to tackle new concepts while I am able monitor student progress and provide immediate feedback.

Yet, the effectiveness of such strategies is dependent upon cultivating an environment in which every student feels valued to participate. It is easy for a few students to monopolize discussions and take away opportunities for other voices to contribute. To create an inclusive atmosphere, I use technology, such as polls and direct messaging, that allows for anonymous and private interactions. I praise thoughtful questions and responses, especially those that promote student-to-student discourse. To help students overcome the fear of being wrong, I tactfully address misconceptions, using them as opportunities to refine incomplete or incorrect thoughts collectively as a class. It is important for students to recognize the inherent missteps that come with learning, and so by normalizing mistake making and struggle, students may develop perseverance and confidence to more freely engage with challenging concepts.

Once students feel comfortable approaching difficult questions, they need to acquire the skills necessary to solve difficult problems and articulate their solution with mathematical maturity. There is a distinction between “knowing” and “doing”, and students must go beyond the rote skills of how to do a problem and develop their ability to think critically. Building this skillset requires exposing rigid attitudes and mindsets to alternative solutions of problems and reshaping them to acknowledge more than a unique method. While students need to be able to solve a problem, they also need to be able to explain the logic behind the process they used to obtain their solution. In class, I place an emphasis on students providing justification in a clear and organized manner and provide constructive feedback on student activities, such as homework and quizzes, to highlight what they understand well and areas they still need to build proficiency.

However, there is no “one size fits all” when it comes to learning, and so I try to be adaptable and flexible with each lesson plan. During my Introduction to Statistics course, students expressed that they wanted to see more problems solved live rather than presented with perfectly packaged solutions. In response, I strove to routinely demonstrate how a student may approach a problem, including both unsuccessful and successful steps to highlight a realistic, “in the moment” thought process. This flexibility in teaching is invaluable to student learning, and I strive to structure the delivery of content according to class comprehension. To balance substitution of lecture time for such modifications, I have recorded videos to reinforce basic techniques and developed interactive GeoGebra applets to introduce upcoming content. I embrace evaluations from both students and colleagues as it allows me to grow as an educator and develop more tools to better address the needs of my students.

2 Broader Impacts

One of my favorite experiences as a teacher is having the opportunity to engage in one-on-one mentorships. At the University of Arizona, I serve as the coordinator of the *Undergraduate Teaching Assistant (UTA) Program* which provides undergraduate majors with the opportunity to learn about teaching mathematics or statistics by participating in a weekly professional development seminar and working with an instructor of an undergraduate course throughout the semester. I have enjoyed helping students develop skills to tutor, create rubrics, grade work, and relay mathematical concepts effectively.

While I am eager to continue teaching at the undergraduate level, I am grateful for my high school background and will continue to seek out opportunities to teach younger students. During my time at the University of Arizona, I have been fortunate to become involved with the Tucson Math Circle, a university sponsored weekly program designed to get middle-to-high school students excited about mathematics through hands-on exploration and discovery. These experiences have been extremely rewarding, and I would be interested in initiating a program that excites the interests and curiosity of the young students within the community.

Yet, many of my most rewarding aspects of teaching have come informally. Having the opportunity to speak with professors about matters not related to their course was invaluable to my undergraduate experience, and I appreciate the moments that I am able to be that professor for some of my students. While it is not impossible in larger universities, a liberal arts college makes it easier for students to build relationships with professors. I am excited about the prospect of teaching at an institution with affords me the opportunity to get to know not only the students' names, but also their backgrounds, interests, and aspirations.

3 Course Development

As my teaching experience expands, I look forward to the opportunity to teach courses outside of my field, as it will allow me to deepen my knowledge of nearby fields. In addition, I am excited about the prospect of developing new courses, such as an applied, special topics course on random graphs to extend the abstract ideas of discrete structures. As the coordinator of the UTA program, I have experience in developing curriculum to discuss practices for good mathematical writing. Consequently, I would be interested in designing a formal course in which students, particularly non-mathematics majors, cultivate their skills to both speak and write mathematics convincingly and precisely.

Although the majority of the courses that I have taught at the University of Arizona have been core courses with set curricula, I have previous experience with designing and developing courses. In particular, I restructured a high-school level, computer science curriculum by introducing object-oriented and procedural programming through Python, substituting some of the traditional class meetings for "labs" in order to provide guided practice on the computer, and scaffolding the development of fluency and understanding with fun and engaging assignments. Although the course was taught using a particular high-level language, I emphasized the course as language agnostic and stressed the importance of developing ideas to solve problems, rather than focusing on learning a particular language. These changes were met with success, as the class size steadily increased each year, growing from an initial size of 8 to 16+ students.