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# Teaching Statement

Christina Durón

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Over the last eight years, I have had the privilege to teach a variety of students who have participated in both high school and introductory to upper-division undergraduate courses. My reflections on these collective experiences, though ever evolving, have profoundly influenced my teaching philosophy and shaped my objective: to cultivate well-rounded individuals who possess flexible mindsets and sustainable skills such that they may positively impact the world. While my teaching methods vary with students, my focus on providing effective instruction, soliciting feedback, and developing learning partnerships within the classroom remains consistent.

## 1 Current Practices

In my early years of teaching, my focus was on instruction. I believed the most effective way to provide students with the fundamental tools to solve problems was through organized lectures. While appropriate for some students, particularly those who are self-directed learners, most struggled connecting concepts with their corresponding applications. Though I strongly believe in having organized material in my courses, I quickly learned that in order for students to develop a deeper understanding of the material, they have to actively engage with its content. However, there is no “one size fits all” when it comes to learning, and so I recreated my class by mixing lecture with opportunities for students to discover the material themselves (e.g., integrating small group activities that encourage student to work together in order to tackle new concepts). I ask guiding questions to provoke critical thinking and incorporate active learning strategies that allow me to engage with students as they grapple with the material. For example, while students work collaboratively, I am able monitor their progress and provide immediate feedback.

The effectiveness of such strategies for students to grow and learn is dependent upon cultivating an environment in which every student feels safe to participate. It is easy for some students to monopolize discussions; however, I work to create an inclusive atmosphere that communicates care, support, and belonging rather than one of judgement. Nonetheless, I do have high expectations for my students, and I strive to challenge and help them reach and then exceed such standards. I praise thoughtful questions and insightful responses to help build confidence in each student without fear of exposure as they learn. I tactfully address misconceptions and use them as opportunities to refine incomplete or incorrect thoughts collectively as a class. Helping students to recognize that missteps are an integral part of learning can have a profoundly positive impact on their lives, and so I seek to create an environment where students feel safe to stretch themselves and take risks.

Once students feel safe to approach 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. Transitioning students from dependent to independent learning requires exposing rigid attitudes and mindsets to alternative solutions of problems, and reshaping them to acknowledge more than a single unique method. While students need to be able to solve the problem, they also need to develop the language and communicate the logic behind the process they used. In class, I place an emphasis on students providing justification in a clear and organized manner while providing constructive feedback on student activities, such as homework and quizzes, to highlight what they understand well and to pinpoint areas they still need to build proficiency.

Effective learning partnerships between students and teachers are those centered around flexibility, and so my lesson plans are constructed to be adaptable. For example, 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 demonstrated how a student may approach a problem, including both unsuccessful and successful steps, to highlight a realistic, “in the moment” thought process. This adaptability in teaching is invaluable to student learning, and I aim to adjust the curriculum, methods, and pacing to meet the needs of my students. To balance the substitution of lecture time for such modifications, I record videos to reinforce basic techniques and develop interactive applets to introduce upcoming content. I solicit evaluations from both students and colleagues; this allows me to grow as an educator and develop a richer toolkit to better identify and address student needs.

## 2 Course Development

As my teaching experience expands, I am excited about the prospect of developing new courses, such as a special topics course on random graphs to apply the abstract ideas of discrete structures. At the University of Arizona, I serve as the coordinator of the *Undergraduate Teaching Assistant (UTA) Program*. This program provides undergraduate mathematics and statistics majors with the opportunity to learn about teaching mathematics or statistics, and I have experience in developing its curriculum to discuss practices for communicating mathematics and statistics well. Consequently, I would be interested in designing a formal course in which students, particularly non-STEM majors, develop their skills to both speak and write mathematics and statistics accurately and convincingly.

Regardless of my teaching assignments, I design my own set of course materials. The courses I have taught at the University of Arizona have all followed a central curriculum, and for each course, I created a complete set of lesson plans, in-class activities, executable programs, and formative and summative assessments. I also have previous experience with designing and developing courses from the ground up. 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 specific high-level language, I emphasized the course as language neutral and stressed the importance of developing ideas to solve problems, rather than focusing on learning a particular language.

## 3 Broader Impacts

Although I cherish my time within the classroom, one of my favorite experiences as a teacher is having the opportunity to engage in one-on-one mentorships. As the coordinator of Arizona’s UTA Program, I have supported the professional development of students through weekly seminars. As a mentor within the program, I have fostered the skills of undergraduate teaching assistants to effectively engage with students, formulate assessments, and evaluate work. The teaching assistants, in turn, have provided me with diverse insights and perspectives to better support students within the classroom to which I would not have otherwise been privy.

While I am eager to continue teaching at the undergraduate level, I am grateful for my high school teaching background and will continue to seek out opportunities to mentor younger students. At the University of Arizona, I am 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 continuing my involvement with the local Math Circle that excites the interests and curiosity of the young students within the community.

Many of my most gratifying aspects of teaching have come informally. Having the opportunity to speak with professors about matters unrelated 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. Although possible at larger universities, the smaller, more-focused setting of a liberal arts institution enables students to build real rapport with professors. I am excited about the prospect of teaching at an institution that affords me the opportunity to get to know more than just my students’ names, but also their backgrounds, interests, and aspirations.

## 4 Conclusion

I have been fortunate to cross paths with many experienced teachers and professors, and have used them as models in crafting my teaching practices. I value the interactions with my students, as those experiences within the classroom continue to influence and shape my teaching philosophy. After all, it is important to allow the students with whom you work to help mold you as a teacher. While the strategies to teach mathematics are ever evolving, I will continue to refine my techniques by incorporating new pedagogy to create engaging and effective learning environments for my students. I look forward to working with and learning from a faculty who share similar values, and who inspire enthusiasm and motivation within the community.