

All students deserve equitable access to high-quality and challenging mathematics instruction and resources. Unfortunately, I know from personal experience that doesn't always happen. There are substantial disparities in support services, treatment, and in achievement formed along troubling lines of race, ethnicity, gender, first-generation status, and socioeconomic status. Universities and members of their faculties must work to close the gaps and create a more equitable and inclusive learning environment for future generations. As an educator, I consider it my responsibility to do what I can to help all students achieve their best using teaching practices such as active learning.

I have personally experienced the hardship that the lack of DEI considerations in the academic environment can have on a student. Before beginning my graduate studies at the University of California, Santa Barbara, I was in a different math PhD program. I didn't feel welcome and supported as a woman in that department, so I felt unqualified to be a mathematician and eventually dropped out of the program. I took a minimum wage job in industry while moonlighting at a community college teaching mathematics and statistics.

On my first day teaching at Cosumnes River College, I was convinced I was underqualified, but my students quickly turned my mood around. They told me about their struggles with math, and how my class made them feel capable. I was thunderstruck by how many of my students told me that they had been told they were bad at math their entire lives, and I was the first person to believe in them. As I watched them succeed, I realized that I was capable of obtaining my mathematics PhD, as long as I had the proper respect and support that every student deserves.

Since returning to academia, it has been my mission to create a community in which those from all backgrounds can thrive in their mathematical endeavors, and to promote equitable opportunity and treatment across the mathematical sciences. In pursuit of that goal, I created my university's Association for Women in Mathematics (AWM) chapter, mentored undergraduate women in STEM, and organized a Directed Reading Program (DRP) whose format promotes a sense of belonging from the math community.

As an educator, I implement active learning techniques, which have been shown time and again through research studies to promote inclusive and equitable learning (see [1], [2], [3]). Active learning is any instructional method where the student plays a part in the learning process. I commonly use pedagogical techniques such as "think-pair-share" and group work. Think-pair-share is when students are given a problem or worksheet to first think through the solutions on their own. Then they pair up with a student to discuss their answers. Afterwards, the students share their results with the entire class. I find that at first students are shy, but as the semester progresses, they feel more confident sharing their answers or questions with their peers. By the end of the semester, a welcoming classroom culture has been built where students feel comfortable asking "basic" questions and talking to their peers about mathematics.

I also inject DEI efforts into my research. The area of Operator Algebras is overwhelmingly male-dominated: less than 17% of researchers in Operator Algebras are women. In Summer 2022, I participated in the Women in Operator Algebras 3 workshop. There I began a research collaboration with a group of women mathematicians. We're working to grow our project into a fruitful long-term collaboration which can impact the research landscape of Operator Algebras. I have also mentored undergraduates through DRP and helped lead a Research Experience for Undergraduates (REU) program. As my career progresses, I will continue to mentor undergraduate research projects.

Additionally, I frequently invite women mathematicians to speak on their research at AWM events. I have also organized AWM events that focus on learning about the contributions of women in mathematics and statistics throughout history. Some of my favorite events include the ones where I gave talks on the history and research of Katherine Johnson and Ada Lovelace. They were wildly popular with students, who say that hearing these stories helped them see their own potential. I have also served as a judge for the national AWM essay writing contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers.

Next year I have active plans to continue to promote DEI efforts in mathematics. The annual Underrepresented Students in Topology and Algebra Research Symposium (USTARS) showcases the excellent research conducted by underrepresented students studying topology and algebra and helps broaden participation in the mathematical sciences by cultivating research and mentoring networks. I have attended USTARS for two years and this year I am shadowing an organizer. Initiatives such as USTARS are extremely important towards an inclusive, equitable, and diverse mathematical community. The following year, I hope to take over their role and help give opportunities to underrepresented students.

References

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