Teaching Statement

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Far from threatening to replace math educators, LLMs have brought the importance of effective math education into sharper relief. Where these tools promise students frictionless access to information, learning math demands time, patience, and persistence. The role of math educators in the age of AI is to model the resilience and critical thinking needed to learn math, and to help students develop those capacities themselves.

In my own teaching, I have tried to share the pleasure of working through difficult mathematics by inviting students into mathematical discovery. For instance, as an invited speaker at the Catholic University Math Club, I wanted to put students into the shoes of early knot theorists attempting to classify knots. Handing out twine, I had students tie physical knots before asking, "How can we tell when two knots are the same or different?" Starting from these physical examples, students were soon proposing simple knot invariants. At a talk I gave for the Association for Women in Mathematics, I coded a musical demonstration of the Fibonacci sequence modulo 7 so students could gain intuition for patterns in the sequence by listening. In both settings, I wanted students to have something they could investigate before introducing the mathematical formalism.

In a more traditional classroom setting, my approach is the same. I often begin a lesson with a problem that naturally justifies building a new tool. This approach was first modeled for me by Courtney Gibbons, my abstract algebra professor, who centered her course around the question, "Why is there no quintic formula?" I find that giving students something to investigate before asking them to master a formal explanation invites engagement. The goal is still a precise, justified answer, but I also want students to learn to keep thinking after an unsuccessful attempt rather than reaching immediately for the security of a clean answer.

I am especially drawn to the challenge of adapting mathematics instruction for a variety of audiences. During summers, I have taught math for GW's Upward Bound program, which supports high school students from Title I schools as they prepare for college. Free to design my own curriculum, I taught graph theory and topology to students ages 14–18, who responded enthusiastically to content that expanded their concept of what math could be. One summer culminated in a graph theory poster project in which students modeled and analyzed real-world scenarios—reality TV, social media networks, metro lines—using graphs. In guest lectures at Georgetown and Catholic University, I presented my research on secure domination alongside standard graph theory concepts. These settings called for different starting points, but shared the possibility of bringing students into contact with mathematics they can explore for themselves. Adapting material for different audiences has helped me develop a wider range of explanations and a better sense of when a student needs a different approach.

In 2026, I received George Washington University's Graduate Student Teaching Prize in Mathematics. Across five courses as the instructor of record, I have learned the delicate balance between upholding expectations and adapting instruction. When students in my calculus class struggled to find relative extrema of trigonometric functions on an early quiz, I took some time out of the next lecture to model a full solution—I passed out unit circles, drew triangles, and reviewed the question—but I also promised them they would see the same type of problem on the following quiz. Success on the second quiz was still mixed. As I saw students successfully find relative extrema of polynomial functions, however, I began to understand their difficulty more precisely: their difficulty was not in applying the calculus concepts, but rather in their familiarity with trigonometry. I wanted students to apply what they had learned even when the functions were less familiar, and I kept that expectation in place. But the experience helped me see that upholding expectations also requires helping students understand where their difficulties lie and what they need to practice. The second time I taught calculus, I emphasized preparation in trigonometric fundamentals while maintaining the same goals for our work on extrema.

I would welcome teaching undergraduate courses in calculus, linear algebra, introductory proofs, abstract algebra, graph theory, and topology, as well as courses such as Mathematics and Politics that introduce mathematics to students outside the major. At the graduate level, my training and research prepare me to teach courses in algebra and topology, particularly topics courses in knot theory, skein modules, and diagrammatic algebras. In these courses, I would be especially interested in helping students make the transition from learning established mathematics to asking research questions of their own.

More than anything, I believe that the unique power of math education is changing students' relationship to difficult problems. That change takes both challenge and the support to make progress when an answer is not immediately clear. I want my students to trust that I take their difficulties seriously and that I believe they are capable of meeting high expectations. Whether or not they enter my classroom thinking of themselves as "math people," I want them to leave more willing to ask questions, try an approach, and keep thinking when it fails—and maybe even find joy in that struggle.