

Teaching Philosophy and Methods

I teach mathematics and pedagogy to prospective and practicing elementary teachers. I want my students to become teachers who create classrooms where elementary students have a sense of community and belonging, make sense of meaningful, rigorous mathematics, and think critically to solve problems. To do this, I need foster these elements in my own classes and then be explicit about the methods and teaching decisions I am making so my students can develop in their own roles as mathematics teachers.

I work hard to create a sense of community and belonging in my classes. Elementary teachers are not generally known for their love of mathematics, and in fact, are reported to have some of the highest mathematics anxiety levels of any college majors. They often enter my class with dread and declare that they are not good at math or that they hate math or that they want to teach grades K-2 instead of 3-5 because of the mathematics. I begin classes with low floor, high ceiling tasks--rich, open-ended tasks that are easily accessible for all students, but which include multiple levels of complexity in terms of the mathematics that can be learned from them. We talk about how to use these types of tasks to support their future students in academic risk-taking and learning from mistakes. Once students feel safe to surface their mistakes and misconceptions, we can work together to learn or re-learn content, subsequently building efficacy and confidence.

Secondly, my students need to learn mathematics for teaching, which is different than mathematics as used in other disciplines. Mathematicians strive to compact their work to the simplest, most elegant solution. Think of a mathematics concept as a well-packed suitcase, streamlined to hold only what is absolutely necessary with no leftover space. Elementary school teachers need to be able to unpack that suitcase for students learning the material for the first

time—so their students can see what is inside “the suitcase” and then better understand the re-packing before moving onto the next concept. A banker needs to be able to find the answer to a subtraction problem. A teacher also needs to know the multiple strategies to get to the solution and why they work, common student approaches and mistakes, and how to give clear explanations that connect to existing student thinking and prior knowledge.

To develop this mathematics knowledge for teaching, I focus on practice-based pedagogies focused on helping my students implement high-leverage teaching practices; that is, those practices that greatly impact student learning and are accessible to novice teachers. These practices include launching an open-ended task, deciding on the usefulness and accuracy of different mathematical representations, eliciting and responding to student thinking, and orchestrating a whole class mathematics discussion among others. My preservice teachers engage in rehearsal of these practices and then enact them in lessons with elementary students in an embedded field experience in which I go into the field with them in a coaching role. They plan and co-teach with a fellow classmate and then debrief with together by creating a podcast about their own teaching practice and their elementary students’ mathematical thinking about the task. I then listen to the podcasts and pull common themes and questions for a collective analysis of our practice before planning together as a group for the next lessons we will teach. In this way, I become a more knowledgeable other in the shared, meaningful work of teaching in an apprenticeship model rather than the giver of knowledge in an acquisition model of learning.

Finally, just as I want elementary students to think critically in mathematical problem-solving, I want my students to embrace the ambiguity and complexity that comes in teaching--to embrace teaching itself as a problem-solving activity. While teaching rests on common

knowledge bases and strategies to draw upon, it also requires conditional knowledge of when to use those strategies based on the particulars of the situation.

My aim when teaching is to provide students with the space and structure to negotiate and re-negotiate their ideas about mathematics content and their role as teachers of mathematics. While I engage students in rich tasks and teaching materials with certain learning goals in mind, I believe that students often create their own meanings that go beyond my intended objectives. It is in the willingness to explore these different meanings together in a community that learning occurs, both for me and for my students.