TEACHING STATEMENT

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1. Teaching Philosophy

I focus on creating mathematics where students feel included in the learning process and students can take ownership of their learning. I want my teaching to be inclusive; meaning that the person has to feel like they belong, feel free to ask questions, get help, and not have their concerns dismissed. My time at Harvey Mudd College, Smith College, and working around Hawai‘i's grade K-12 classrooms has given me strategies I implement to further this goal.

By creating an environment where my students know it's safe to ask questions and make mistakes I encourage students to never think they are "not a math person," and that they can understand it if they come talk to me or their peers. I create this environment in different ways. One way is by avoiding saying words like "clearly" and "obvious" unless I explain want I mean by these words. For example, if a theorem statement follows straight from the definition, I tell my students that instead of saying "the proof is clear." My real analysis students have appreciated the attention to language I give and have told me they have less trouble understanding their text because they recognize these phrases.

When I teach, I strive to create a story of the math course and ensure that we transition from one topic to the next smoothly. I share this intuition with my students so they can begin to create their own stories of the subject matter. Some of my students will be able to create these links between the material in the course and others will need more help navigating the story; for both students I create an enviroment that lets them know the pace they are learning is fine. For those that come in with math anxieties, I share with them my anxieties I worked through as a math major. In this way, they know they are not alone and that if they seek help it will get better; the story will come with time.

I design my lessons to be part lecture based and part group work to engage my students no matter their learning styles. In this way, after I share a new concepts students can practice the techniques and I cdan check their understanding. I encourage my students to think deeply on a topic in class by creating writing assignments that require my students to explain important concepts to others in a letter. I have implemented this writing project many times and have seen the improvement in my students ability to write and synthesize mathematics. For example, my Hawai‘i calculus class wrote to an imaginary eighth grader to explain clearly what a limit, derivative, or integral is and why it is important. They discovered how to write about mathematics and how to break down a complicated topic for someone who has never seen or heard of it. My Smith calculus students wrote to each other for a semester. At the end of the project, students met with their penpals to reflect on what they had learned in the writing process; they had found that in writing with their penpals they had strengthened their understanding of key concepts, like the meaning of integrals in both single and multivariable spaces. In my math for elementary school teachers course, they became penpals with a second grade class in Hawai‘i and discussed different math problems the second grade students were learning. This writing assignment was even more beneficial because it was many of their first opportunity to interact with young children as educators. They saw the techniques we learned in class could be implemented at any age and during the process of writing back and forth

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my students realized the importance of clarity and details of explanations, use of pictures, and repeating ideas.

I have had the opportunity to teach several different kinds of classes – second grade, high school, prospective elementary teachers, calculus, real analysis, and number theory – and I alter my teaching style to fit the situation. My calculus classes tend to have more lecture, since we have to cover a lot of material in a short amount of time. I have incorporated time for questions, group work, and projects as much as time allows. For example, on the first day of calculus, my students played a game where they had to describe a picture or graph to their partner who could not see the image. This had students more engaged than a straightforward lecture would. They reviewed precalculus concepts, like max, min, and critical points, and practiced explaining math ideas using every day language. In math for elementary teachers classes, I spent almost no time lecturing, acting more as a facilitator or a math consultant. The students were focused on inquiry based learning and the group work helped facilitate their learning. I have also taught more in balance between lecture and group work in other courses, like number theory. My students would do a light read of the chapter to get familiar with the theme of the chapter. They would sometimes work in groups through class to implement an idea or theorem they had read about. Other times I lectured in order to go into more detail on why we do specific steps in a given proof.

I look forward to the opportunity to continue to learn and grow as an instructor, and to find the right instructional strategy for my students to allow them to grasp the material.

2. Outreach and building inclusive environments

During my graduate years, I helped organize and secure funding for outreach events in Hawai‘i, including ‘Be a Scientist Tonight’ and ‘Minds Expanded.’ I created math activities for events organized by Graduate Women in Science and SUPER-M (the NSF GK-12 fellowship at University of Hawai‘i at Mānoa) at several schools, community centers, and shelters all over the islands. I designed Hawaiian math activities in partner with Kamehameha High School (a private school for Native Hawaiians). Our partnership ensured that we created activities that integrate Hawaiian culture into the math classroom. I later presented some of these activities in classrooms across the Hawaiian islands, at the Hawaii Council of Teachers of Mathematics (HCTM) meetings, and at MATCH (Math Teachers Circle of Hawai‘i). You can find some of the activities I designed online[1] [2].

I founded the graduate student seminar at University of Hawai‘i; a seminar for graduate students to present their research and interests to their peers. This gave several graduating students an audience to practice their defense as well as expose new students to the research taking place in the department. This also helped build a culture of asking questions, as we were more open about asking a peer to explain a concept.

Prior to graduate school, I worked for Upward Bound at El Paso Community College, a four year program intent on helping at risk high school students become first generation college students, and Project Dream, a summer abridged program that helps prepare freshman for college by helping them place into for credit math and English courses, improving the colleges retention rate. These programs help build a community for traditionally underrepresented minority students, faculty, and staff and are important if we want STEM fields to flourish. I want to participate in these sorts of programs and start them wherever I am.

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[1] A math activity based on the traditional Hawaiian game ‘Ulu Maika: `http://superm.math.hawaii.edu/_lessons/ninth_twelveth/ulu_maika.pdf`

[2] A math activity using origami pinwheels to teach children modular arithmetic: `http://superm.math.hawaii.edu/_lessons/k_five/magic_pinwheel.pdf`.