Personal Statement

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As a teenager in high school, I would never have believed I might someday become a college math professor. My guidance counselor warned me to avoid algebra, proclaiming it "too hard" for me. Nevertheless, I took that first algebra course and survived it, through time-consuming labor coupled with an intimidating fear I would not succeed. Interestingly, that first course turned out to be the hardest math course I ever took, and math seemed to "click" for me from then on. The experience proved to be important to me as a teacher, and I've been spending a lifetime trying to discover what caused my initial struggle, what I did to overcome it, and how I can help community college students understand what I learned through it: that through hard work and perseverance, they can gain the confidence to overcome obstacles, not only in mathematics, but in any difficult endeavor they may face.

Algebra is a "gate-keeper" course into college mathematics. Many students who can't successfully complete it will give up on any future study in math, science or engineering. Algebra is a "foreign language" to some students, and the skills don't come quickly or easily. Increasingly in our instant access culture, students often give up, and see math as irrelevant, unrewarding and boring. One of my instructional goals is to assist students in understanding that to learn math, they have to practice productive persistence. Much of the power and beauty of algebra comes from the fact it is so general and works in such a variety of contexts. Students need help, however, in learning to apply algebra to solve specific, real-world problems.

In order to engage students in learning about math, I've spent much of my teaching career developing activities to contextualize math. Students need to recognize that they must develop algebraic thinking skills that extend beyond the classroom. They need to think mathematically when faced with real problems, to see math/algebra as a tool to describe those problems, and solve them. Many students who have passed through traditional instruction in algebra still fail to

have a strong understanding of foundational concepts, such as variables and functions. Without these, algebra remains a purely mathematical exercise with little connection to real life. It's crucial to engage students in non-threatening math activities designed to help build an understanding of algebra based on things they've already known or experienced. You can't always ask students to discover abstract things outright, but they can be assigned specific, recognizable tasks designed to use algebraic concepts and allow them to make independent "math discoveries" on their own.

One tool I use to contextualize math for students is SAM, a calculator-controlled robot I co-created with a colleague in the Physics department. Students are challenged to make SAM navigate a maze, collect data, and perform various tasks. They're motivated to make SAM perform correctly, often in competition with other students. Algebra is used naturally as a tool, wherein students discover the utility and power of algebraic variables and functions to "make things happen". They also soon realize that computers, cell phones, and gaming systems all use algebra to perform tasks. This "function thinking" in a specific, physical context helps build a strong foundation for students' general understanding of algebra. Such activities present innovative opportunities for natural, physical assessment. Either the robot works or it doesn't. Students want to make the robot function correctly, and will persevere until it does. Such assessment allows for immediate and motivating feedback. Students instantly discover what they know and what they still need to learn, instead of waiting for the traditional methods such as waiting for a paper or test to be graded. Math becomes real when instructors use problem-based math activities such as this one.

By teaching that math matters beyond the classroom and engaging students in real-life math scenarios, I have witnessed students not just 'persevering' but also being excited about learning math.