

Education has been important to me from the very beginning. Turning to the study of mathematics and science was only natural for me. Up until the point that I entered into the university world, math was for the most part easy. This is not true for everyone though. Although I possessed a gift for math, I still needed the guidance of teachers. Throughout my past, I have had so many teachers that have made a difference in my life. It is hard to put exactly to words what makes a teacher great. It has to do with patience, positive attitude, and dedication to imparting knowledge and intrigue to students. There are other qualities such as maintaining the balance between sincere personal relations and professional respect as well. My experiences teaching undergraduate mathematics and being a part of high school outreach activities has solidified in me what I hold as the desirable attributes of a teacher.

It's the little things sometimes that can make all the difference. I will never forget my second grade teacher who actually picked me up for school in the morning to get me to class on time. Since my walk was through the woods, I would often take a little longer than expected due to my fascination with nature! Although I wouldn't expect this from any teacher, it's just one example of the difference a teacher can make. My high school French teacher also showed an intrinsic concern for me when I was leaving high school a year early to finish in an alternative program. She was worried that I was making a mistake and wouldn't go to college as I planned, but I did indeed start junior college the next year and am now finishing my PhD! She sure would be proud. My high school math teachers have always been supportive of me, and who knows, maybe that is what made the difference. The point is that I have had great teachers, and if I can make a positive impact like they have, even if only with one student, I will consider myself successful.

Graduate teaching in the Math Department at the University of Arizona can be intense at first due to the fact that it entails the full duties of a college instructor. For four years, I have created curriculum, designed and graded exams, held regular office hours, tutored all levels of math, and assigned student grades. There is an enormous support structure in place to make this a complete learning experience and successful in all respects. Instructors meet regularly to discuss curriculum and grades, and this in particular was helpful. In addition to my teaching record, I have also been involved in several high school outreach activities. Seeing the vast differences between the educational environments of high schools and universities increased my awareness of issues facing modern education.

My primary outreach activity was creating and executing new curriculum at City High School, a liberal arts based charter school. This was enabled by the CATTS fellowship, the *collaboration to advance teaching technology and science*. One thing the students there particularly enjoyed was an activity I developed using my research with interacting particle systems for biological invasions. I had them simulate a simplified version of a stochastic process using playing cards and coin flips. The result was exactly what I had intended. They saw the different types of behavior that can be seen: some populations persisted, while others died out. It was also an exercise in following precise instructions, and I successfully led them through it.

The undergraduate course that I have the most experience with is college algebra, primarily taken by freshmen of all majors. My perceptions of this course directly relates to what I saw during my CATTS fellowship tenure at City High. The transition from high school to college can be overwhelming sometimes. In fact the transition for me from junior college to a university was extremely difficult, so I can fully understand. Seeing the issues faced in a high school classroom really made me understand why there is widespread difficulty in college algebra. It could almost be caricatured by saying in high school, "you show up, you get an A", while at a university, "you work hard enough, you might get a C". Now this can be an exaggeration in many cases, but the truth remains that there is a vast difference between high school and college. The care in a high school can be, and necessarily is, more personal. This contrasts with the university environment where the student has the responsibility to reach out to the instructor. Although when university instructors make the extra effort to reach out to students individually, the result can be a greater success rate. This is something I strive for.

I often refer to high school teachers as "front line soldiers", they are in the trenches trying to get

students on the path to college, while sometimes college teachers can be a little indifferent. I stay involved with my students and let them know that I am there to help. I have a knack for developing good relations with students. I still visit City High School every now and then, and the students always want me to come back and teach a class.

Another truly beneficial time for me was during the Native American Summer Math Camp. This is a three week long course for local Southern Arizona Native American high school students. The curriculum is based on the science and economics of beekeeping. I have seen these students grow in maturity over even a short summer session. This introduced me first hand to issues that under represented students have to deal with.

I have always tried my hardest to help students and to be there when they need help. I will put forth all energy I have to aid my students along the quest for understanding. This has been especially evident when I work on an individual level in office hours or tutoring sessions. I have been told many times by students in the tutoring lab: “This is the most help anyone has given me here!”. This is not because I just gave them the answers; it is because I put forth effort to help them develop their own understanding, and I did not give up. In course evaluations, I have seen students make the remark: “This is the best teacher I have ever had.”. It gives me great pleasure to hear these things and lets me know that I am doing something right!

Not everything in teaching goes perfectly though. One of the worst experiences I have ever had teaching was a plagiarism incident when I was teaching business math. One of the group projects turned out to be a word for word copy of a past project by another student. This was heartbreaking for many reasons. It made me feel that I had failed as a leader. It is not enjoyable to take disciplinary action, but this is just something that a teacher has to deal with and I learned the process for dealing with this type of issue. The issue resolved well due to my professional manner in dealing with the students and the guidance from my supervisor.

Encouraging students to attend office hours is absolutely a priority. As an undergraduate, I vigorously attended office hours, and it was essential to my success. I loved the interaction with my instructors. I remember specifically one instance in calculus at the University of Texas when I argued with my teacher about some point. I was probably wrong, but I think she enjoyed the fact that I was so concerned with this one detail and was trying so hard to understand it. This is the high point of education, when the student has an absolute desire to learn, and the teacher has an absolute desire to be active in that process. Now I can look back at similar arguments I have had with my students when they are trying to understand something. It really is a beautiful process. I always encourage my students to find new ways to solve problems and when I see someone developing their own unique picture, I encourage them. Nothing compares to how it feels to see that “aha!” moment in one of your students. It takes dedication and patience to help them reach that state.

One thing I have seen all too often in teachers is a negative attitude towards their students. I know first hand how frustrating it can be for the teachers also when students aren’t doing so well. Seeing the same mistakes over and over again can be quite disheartening, but we can not let it overwhelm us. As a professional, it is necessary to try hard at maintaining a positive attitude towards our students and to not demean their lack of knowledge. Even when my students just can’t seem to get it, I still give it my all.

Although I possess the knowledge and experience to teach at all levels of mathematics, what truly makes me a qualified teacher is the willingness to learn from my students and to constantly improve my abilities and methods. With my inherent abilities complemented by my training, I am prepared to succeed in any teaching situation.

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