

Teaching Philosophy

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I started doing math when I was very young. Although my peers felt that mathematics was boring and complicated, from the very first encounter, I discovered beauty in mathematics. To me teaching mathematics is to share this beauty with others. Moreover, I would like to show my students that apart from being beautiful mathematics is applicable in many contexts.

I have been teaching at all levels since 2003. My first teaching experience was in a community college in Iran, designed for professionals from all walks of life who wanted to further their education. Teaching in this college was widely considered as challenging. They recruited graduate students from top universities, and anyone who taught there for more than a semester was considered to be a seasoned teacher.

I taught second year “Probability and Statistics” at this college, each class with around 60 students. As a first time teacher I had to quickly adopt strategies to suit this setting. There were older students who had not studied math for many years. Since many of my students worked, it was hard for them to find free time to study.

The challenge that I had when working with older students was to balance acting as an authority and showing respect that was appropriate for their age. They were very well aware of their weaknesses in comparison to younger students, so at first I tried to build up their confidence by asking them questions that I anticipated they could answer.

I believe that in an engaging lecture the teacher is not the only speaker, so I try to persuade my students to ask questions. Since many students are not comfortable asking questions in class, in the beginning of each class I ask them very simple facts about my previous lecture in order to motivate further questions, and I stay in my office after the lecture to answer their questions in a more comfortable setting.

But in this college, since lots of my students did not have enough time to study after the lecture, at the end of class I gave very easy quizzes to provide a further review of my lecture. I received the top teaching evaluation in the department that year.

From 2006 to 2010 I taught “Algebra and Probability” in a high school in Tehran. My students were young and energetic. My responsibility in this course was to teach them what the logic of math is and how they can prove mathematical statements correctly. The first time I taught this course, I found out since my students had not had any courses in the foundations of mathematics, they were not familiar with mathematical thinking. For them math was only numbers, operations and geometric shapes. I had to modify their perspective.

In the first class I asked them to prove an easy theorem in geometry: every point on the perpendicular bisector of a line segment is equidistant from the endpoints of the segment. They drew a line segment, chose a point on its perpendicular bisector and measured its distances from the endpoints with a ruler. Afterwards, I explained that in mathematics we are interested in generality, and the point that they chose on the line segment was only one point. One could ask, how do you conclude a similar result for another point? If you chose the second point we could ask the same question for this new point, and since there are infinitely many points on a line segment, this procedure is not practical. By using this easy example I showed them why we needed mathematical logic to prove statements in the general case.

In the 2007-2008 academic year I also taught at Azad University in Tehran. I taught Calculus I and II, Differential Equations and Statistics to civil engineering students (I had about 40 students in each class). Since the students had an engineering background, they were interested in the applications of math to their field. So I modified my approach by discussing math in the context of its application to physics. For example I explained that calculus was first introduced by a physicist, Issac Newton, to solve the problem of planetary motion, the shape of the surface of a rotating fluid, and many other problems.

In 2009, a year before coming to Canada, I taught a third year undergraduate course, “Complex Analysis” at Amirkabir University. This was a completely new and enjoyable teaching experience because all my 25 students were math majors. As a student of pure math myself, I know that for math students the precision and beauty of mathematics are most attractive. Once again I needed to adopt a different teaching style. In this class I tried to prove theorems as accurately as possible, and explained current research in the field. For example I am interested in Banach algebras. While I proved Liouville’s theorem, I explained to my students that Liouville’s theorem proves that the spectrum of an element in a Banach algebra over complex numbers is nonempty. I pointed out that by applying this result, we can prove one of the most elegant theorems in Banach algebras, namely the Gelfand-Mazur theorem.

I had the opportunity to teach as a TA in Canada for four years. I have also been teaching in the USA since August 2015. Teaching in another country was a totally

different experience for me. In Iran, students have seen Calculus before attending university, but in Canada and the US for many students their first encounter with Calculus is in the university. So I had to change my teaching strategy once again. I first tried to show them that they didn't need to remember all formulas (for example the derivative) , but only needed to remember a few basic formulas, and others can be deduced from those. I tried to find out what they had learned in high school pre-calculus, trigonometry and algebra courses, and made an effort to build my lecture based on those familiar concept.

I found teaching in a new country, new language and a new learning culture challenging. After one or two classes, I realized that I need to revise my strategies that I had developed after so many years of teaching. I sought help from a former Canadian or American instructor and followed his advice till I felt satisfied that my class had stabilized and my students were receiving the best instruction that I could give them.

This experience has been one of the most rewarding in my teaching career; one that has taught me that teaching is an ever evolving job at which one can excel only by constant adaptation and high sensitivity of each classroom.