

TEACHING PHILOSOPHY

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What is the role of a teacher in a person's life? I have often pondered over this question. Then, I think about my Dad's favorite words, which are engraved in my mind:

The Teacher is more respectable than God. It is the teacher who tells you about God.

Then I visualise myself as a five year old child, who entered school for the first time in my native town. After years of learning and cramming lessons, by the time I graduated from high school I could feel the transformation in myself. There were some teachers who liked me due to my academic excellence. At the same time, some were quite harsh to me because I rarely paid attention during their lectures. Looking at those days of my life, it is impossible to ignore the importance of a teacher in one's life. Then I went for my undergraduate degree, followed by graduate school, which added some finishing touches to my personality. It is the teachers who help students to grow into responsible people who can be a valuable asset for the society as well as the country.

My first teaching responsibility was to serve as the Teaching Assistant (TA) for the Control Systems lab in the Department of Electrical Engineering at North Dakota State University(NDSU). I was supposed to help undergraduate students in performing experiments and answer any questions they might have. Till that time, I was under the impression that if a person is proficient in the subject matter, delivering lectures is an easy task. Oh, I was so wrong! On the very first day of the class, I was flooded with questions on the subject of the experiment. Though I tried my best to give satisfactory answers to the students, I could feel that there was something missing in my approach. For example, I was not able to understand whether the students were satisfied with my explanations or not. Here I could see an opportunity to develop my interpersonal as well as instructional skills. For the next three years, I tried different approaches to improve myself as a TA. One of these was to give students enough time to think on their own before helping them. Fortunately, most of them liked this strategy, and it also improved their troubleshooting skills in the laboratory. Later, I also taught the Electronics lab for Mechanical Engineering students. This gave me a good opportunity to work with students from other majors, many of whom had completely different backgrounds.

While I was working on my Master's research in Electrical Engineering, I realized that my Mathematics background was not enough. Moreover, I was working in Automatic Control Theory, which requires considerable knowledge of Mathematics. So I took a couple of classes from the Mathematics Department at NDSU. At that time, I came across my present supervisor whose expertise is in Applied Mathematics. He exposed me to some interesting areas in Control Theory, like Absolute Stability, etc. He also presented some ideas which, he thought, could solve some challenging problems in this area. These areas also have interesting applications in

the real world. Since I had an engineering background, those ideas sparked my interest, and I decided to switch to Mathematics for my PhD after completing my Master's in Electrical Engineering.

In Fall 2008, I began my Mathematics career as a Graduate Teaching Assistant. I was assigned Calculus I recitations. The first thing I noticed in the class was that most of the students are heavily dependent on calculators. But the course instructions strictly prohibited usage of calculators. So I had to figure out a way to motivate them not to use a calculator but still enjoy the problem solving session with me. First, I had to forbid them from taking the calculator out of their backpacks. Then I asked the students to take baby steps in the problem and do the calculations on their own, unless they hit an obstacle. Once they got stuck, I used to help them by asking them quite easy questions. Most of the time, I observed that while answering my questions, they were able to see the next step. This approach helped me to train the students, so that they can be more confident in themselves.

While teaching, I have noticed that though the students know the arithmetic, it is their anxiety which causes them to commit mistakes. I often see their fingers trembling while doing some calculations, or they scribble something in a hurry and then they erase it. So, I feel the need to help them to get rid of their anxiety. I often introduce group work in the recitation to encourage students to discuss among themselves. While doing group work, the students talk to their colleagues, and they don't feel nervous or tense as if they were talking to the instructor or teaching assistant. Besides taking care of their anxiety issue, this approach also makes them confident of themselves, since they explain the solution to others in their group. I have often seen comments in my student evaluation like "The TA makes recitation fun by assigning groups. And, it is fun to solve problems and discuss with the group". While doing group work, I try to be as accessible as possible, but I still make them do the work independently.

Another way to motivate students is by the style in which the subject matter is presented to them. I try to show them how much I care for the subject, because I feel that my enthusiasm for the subject acts as the driving force for them. I often teach in a loud but clear voice, moving around the room a lot and using dramatic gestures to bring the subject to life. It helps me to keep the students engaged, so that at the end of recitation each one of them learns something useful from me.

As an alternative attempt to actively engage the students, I encourage use of technology in my classes. I have taught classes on Applied Calculus and College Algebra, where usage of graphing calculators like TI-83, TI-84, etc. is allowed. Even the national standards set by the National Council of Teachers of Mathematics (NCTM) emphasize the role of technology to engage the students in the learning process. With the help of calculators and computers, students can examine more examples. This helps them to explore the significance of conjectures efficiently. However, I make sure that the students are not misusing technology. For example, the graphing calculators in College Algebra can give the graphs of certain functions. But the task of defining a proper window and how to analyze the graph has to be done by the students on their own.

Though technology helps to enrich students' understanding of Mathematics, it should never be considered as a replacement for basic understanding and intuition.

I also treat the students with respect. To start with, I try to memorize their names as soon as possible. In his book "How to Win Friends And Influence People", Dale Carnegie said :

The best way to offend a person is to forget his or her name.

I have heard students commenting, "He knew our names so quickly. Thats impressive." It also helps me to stay in touch with my students even if I meet them outside classroom.

In the recent past, I had the opportunity to serve as the primary instructor for classes like MATH 103 (College Algebra), MATH 105 (Trigonometry), MATH 266 (Differential Equations),and MATH 265 (Multivariable Calculus). These classes are full of students with diverse backgrounds so I got the chance to deal with students from very different majors. Besides these, I have also served as the TA for the Excel section of MATH 165(Calculus I), and MATH 166(Calculus II). The Excel section is an Honors section, where we meet for twice the normal time, and we cover material in more depth.

Presently, I am serving as a Teaching Fellow in the Mathematics Department. I teach my classes passionately, so that it becomes easy to relate with the students. Through these years of teaching Mathematics, I have developed a taste for teaching this subject, and I wish to share its beauty with others.