

## Teaching Philosophy

A bit more than ten years ago my father passed away, but he had already given me something that would hold me strong through all the difficulties I was about to face. Something that, no matter what kind of life challenge I was facing, would keep me happy; a passion.

Growing up, my father used to share with me any books he was reading, from politics, history, poetry, science, or philosophy. Our discussions on astrophysics kept evolving more and more. I was soon, fascinated by the Universe, galaxies, and stars. I kept having ideas and thoughts about the Universe, and no matter how naive my ideas might have seemed to someone else, he always encouraged me and made me feel confident with my ideas. Astronomy and physics gradually became my passion, and he filled my room with books and archives of astronomy magazines. These experiences have led me to understand that my main and ultimate goal of teaching is inspiring others to follow their passion or motivating them to pursue physics and astronomy as their passion.

My father was one of the most influential people in my life and my teaching philosophy is strongly affected by his approach towards educating me. He was incredibly encouraging and unbelievably patient with my questions. Based on how he taught me, I believe the learning process happens naturally when students have a question in mind or a passion for the topic. Therefore, I find it necessary to make students interested in the discussion topic. With this being said, several short phrases sum up my approach and help me achieve my main teaching goal, which is inspiring others: **developing intellectual curiosity, improving teaching based on continuous feedback, enriching teaching based on storytelling skills.**

**Developing intellectual curiosity:** I believe that science and physics in particular, have developed from questions; sometimes odd ones. Therefore, I believe every question should be considered with a sense of novelty. In my undergrad years, in a 'special relatively' class, I once asked an imaginative question which made the whole class burst out laughing. The professor's response to my question, however, was so encouraging that it has impacted me over the years. He got really excited, encouraged me, and told the class that the question was similar to questions that Mach and Einstein (two famous physicists) had asked themselves.

Expanding boundaries of science has always been initiated by questions. Avoiding questions to me means avoiding creating science. Constantly asking and answering questions, not only helps pushing boundaries of science, it also develops one's critical thinking abilities. I myself learn more efficiently if I have a question in mind and go from one book to another and one paper to another to find the answer to it. I have never learned as much or as deeply just by sitting in a class or reading a textbook from front to back. Thus I take possible steps to encourage questions in the classroom. Moreover, the approach of my professor and my father towards my questions has helped me realize the importance of making students feel safe and confident with asking their questions. It is very important to me that my students know I am not there to judge them for their questions, but to help them with their questions. Encouraging questions and taking time to answer them is particularly appreciated by students, for instance one student (Phys259 laboratorial, Winter 2015) in a formal evaluation by the department noted:

“Mehrnoosh was very very willing to answer any questions we had. Even if it was not on topic (aka anything physics related) ... She also really supported me when I didn't understand a topic - she would teach me in different ways until I understood.”

**Improving teaching based on continuous feedback:** My father always used to tell us that becoming over-confident or arrogant is often the start of big mistakes. As a role model for us, he himself was very humble. This, over time, made me recognize that I will never be perfect but I can always keep improving. In teaching, student feedback makes this continuous improvement possible. Therefore, other than the formal evaluations performed by the department, I endeavour to talk to students or mentors outside classes to find how to improve my teaching skills.

One feedback that I received from a couple of students in the first semester that I was teaching in Canada was that my accent was too hard to understand. As a result I worked (and am still working) hard on improving my English. I repeat words and physics jargon over and over again till I get close to the correct pronunciation. Due to this my evaluation result from 3.18 (out of 4) in my first semester of TA in Canada in Regina, went to 3.55 (out of 4) in the second semester, where 4 is excellent, 1 is poor, and 0 is ‘not applicable’. This process has not only affected my teaching, but has also helped my academic life in other ways.

Another comment that I received early on in my teaching was that I was too shy and timid. I have pushed hard to leave the shyness behind and that has enriched both my teaching and my academic life in general. Moreover, this has encouraged me to be less private and as a consequence I was able to incorporate my physics stories in my teaching.

**Enriching teaching based on storytelling skills:** To me, physics phenomena are often funny little stories. For example, a gas particle, in a container, is a ‘drunk’ person randomly walking around hitting the container walls and other ‘drunk’ particles and causing pressure. Interactions or forces between particles are ways for particles to ‘communicate’. When I teach circuits, I myself become the particle in the wire and I explain what happens to me when I meet a battery or a resistance. Formation of stars is a constant battle between forces as ‘enemies’ and ‘friends’ in a star. There are many other examples like this. I have repeatedly found that if I am not able to explain a concept well, it often means that I must go deeper in my understanding.

I am not the only person cherishing these little stories. I have observed that the students really enjoy them too. It makes them smile and grasp the concept immediately in the classroom, and that has been reflected in the evaluation forms. For example, one student (Phys223 laboratorial, Winter 2017) in an evaluation conducted by the department, mentioned:

“Her explanations are amazing. Even somebody who has never done physics before would be able to understand if Noosh was their teacher. Her friendly attitude inspires you to not skip over challenging problems and tackle them head on. She is always willing to help and keeps on explaining until she is completely sure that you understand.”

I believe these three approaches or philosophies will continue to advance me towards my goal of motivating students and assisting them in finding their own passion. To better commit to my teaching objectives and philosophies, I make a constant effort, time permitting, to volunteer and talk to younger students at events like open houses and Explore IT. For me, a most rewarding feedback is when I see students becoming motivated in a course. One sample feedback (provided by a student in a formal evaluation conducted by the Physics Department) was: “Mehrnoosh was extremely passionate about her subject and that motivated me to want to try hard despite a science course not being my line of study.” (ASTR209 lecture, Summer 2016)