Teaching Philosophy Statement

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Beliefs About Teaching

The Hindu Vedas place teachers on a high pedestal: "*a guru creates and sustains knowledge, and destroys the weeds of ignorance, just like the creator, the sustainer, and the destroyer of this universe*". It is no surprise then that students see teachers as authority figures that teach them the truth. Thus, the teacher has a profound responsibility to guide students by helping them to assimilate and to critically analyze facts. The teacher must also prepare students to cope with contradictions between what is being taught in the class and what they experience in the real world. Ultimately, the goal of the teacher is to transform the students from collective followers of knowledge to independent seekers of it.

I believe the role of a teacher is to align teaching activities along the path that works best for his or her class and to create a constructive learning environment. This requires flexibility and willingness on the part of the teacher to constantly innovate and reinvent him or herself in order to facilitate better learning, i.e., a teacher must be open to new ideas and not pinned down to a particular methodology. In addition, I believe in taking the students on board and making them equal stakeholders in the learning process, such that the class as a whole aligns itself towards the final outcome. Therefore, teaching for me is a collective and a democratic activity, which is facilitated by the teacher and which results in a shared learning experience.

Teaching Practice

During my undergraduate education at IIT Kanpur in India, I worked with Prof. S. P. Das as a project associate in National Program on Technology Enhanced Learning (NPTEL). We designed a course for online education titled "Microcontrollers and Applications" and my job was to structure and prepare the course content on microcontrollers for a broad audience. For each lecture that I prepared, I presented the lecture material to another project associate and solicited his feedback. This helped me understand the things that could be improved both from a student's, as well as a teacher's, perspective. Overall, this program helped me develop skills to create and structure a course. In addition, I came to appreciate the role of technology in reaching out to larger sections of the society.

As a Masters student at Max Planck Institute for Informatics in Germany, I assisted Prof. Jens Dittrich in teaching a class on Database Systems. It was a large class consisting of more than 100 students and I was responsible for tutoring 20 students. This class exposed me to a large classroom setup with a live audience. Since this was my first such experience, I tried to think like a student by attending all lecture sessions as well as working on the exercises. Then, I asked myself the questions: *what would the students expect from me? which activities will they want to do in the class and which things would they rather skip?* With this approach, I was able to gauge the average student understanding and their common questions. At the start of each tutorial class, I devoted 20 minutes towards addressing those questions and clarifying possible misconceptions. The students loved the 20-minute introduction because they could relate better and the tutorial became more than a problem-solving session. This class taught me the importance of understanding your students and their needs. My mental model of a teacher became much more proactive, and I was constantly looking to adapt my teaching and to make learning more relevant and meaningful.

I was involved in several teaching activities during my Ph.D. program. In particular, I developed and conducted a series of 3 lab-courses for graduate students. The goal was to allow students to have hands-on experience on advanced topics in Database Systems. I structured the lab-courses as a combination of individual presentations and group-discussion sessions. The idea was to create an environment of equal and active participation, rather than simply having me present the material. In these lab-courses, I challenged the students with difficult problems from my PhD research. My job was to create the environment, provide resources, and to help the students navigate towards the solutions. I was just the facilitator in this process. These lab-courses were very successful in stimulating student interest and introducing them to database research. Together we came up with new findings and published our results at top database research venues. In addition, several students in the class successfully transitioned to PhD programs. I did a similar blending of research with teaching at MIT, as a postdoc,

where I created exercises to introduce graph analytics problems to a database lecture by Prof. Samuel Madden. As a result, several students got interested in graph analytics, and one of them wrote her Master's Thesis on graph analytics with me. My take way lesson from the lab-courses was that students have tremendous creativity and potential. As a teacher, I need to stimulate their interests and nurture their talents. Furthermore, I saw that teaching and research go hand in hand.

Finally, after having taught in three different countries in three different continents, I am a firm believer that humans are diverse by their very nature and that part of our education should include understanding each other. Just as we recognize pluralism of thought as an intellectual development, understanding diversity (a more general form of pluralism) should be recognized as human development. Diversity, therefore, should not only be a part of our teaching but also a basis for teaching. A teacher should come to the class fully prepared for different kinds of diversity, rather than suddenly discovering it (or ignoring it) in the class. For this to happen, the teacher has a responsibility to be aware of his or her class and the society around them. Students should come to class as diverse individuals and should leave the class as equally diverse ones. The teacher should not try to overcome the diversity, but rather to enrich it by extracting, developing, and sharing ideas.

Teacher Training

Apart from the hands-on teaching experience, I also successfully completed the *Teaching Certificate Program* with the Teaching & Learning Laboratory at MIT. The major highlights of this program were an introduction to research on how people learn, designing a course and constructing a syllabus, constructing effective problem sets and exam questions, planning and facilitating a class session, interactive teaching and active learning, teaching inclusively, enhancing learning with educational technologies, and micro-teaching exercises. In this program, I developed my teaching skills, including exposure to relevant research and learning, and opportunities to reflect on and plan my future teaching. More importantly, this program shaped me to recognize the value, the effort, and the art of teaching and to establish a strong sense of commitment to the teaching enterprise.

Teaching Experience

Microteaching, Teaching Certificate Program, MIT, Summer 2014.
Lab Assistant, From ASCII to Answers, MIT, Fall 2013.
TA, Advanced Information Systems Lab, Saarland University, Germany, Winter 2011.
TA, Advanced Information Systems Lab, Saarland University, Germany, Summer 2011.
TA, NOSQL: Managing Data (almost) without a Database System, Saarland University, Germany, Winter 2010.
TA, Advanced Information Systems Lab: OctopusDB, Saarland University, Germany, Summer 2010.
TA, Database Systems core lecture, Saarland University, Germany, Winter 2009.
Research Associate, National Program on Technology Enhanced Learning, IIT Kanpur, India, 2005-2006.