

Statement of Teaching Philosophy

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“I hear and I forget. I see and I remember. I do and I understand – Anonymous”

I believe that learning, is the process of constructing personal bridges that reach from familiar knowledge to new concepts and ideas. My teaching philosophy is to provide students with the necessary reasoning skills to build their own connections. In my experience, the best way to accomplish this vision is to guide students as they experiment with ideas, and help them make these ideas their own through practice. For me, teaching is a two-way gift, where I help students develop skills and knowledge, and in return, from the interaction, I get new insights that help my research.

My teaching goals are three. First, guide students to develop general critical thinking skills, that will help them in their personal and professional lives. Second, help students gain the technical intuition required to solve challenging problems. And third, teach students the set of principles that, through years of research and practice, have emerged as basic building blocks useful in the solution of a wide range of problems in the subject area.

As a compiler design lecturer at a Colombian University, I noticed that the heavy theoretical development of the area discouraged many students. I designed a game, in which students played the parts of a “human” compiler, with actors for the scanner, parser, and code generator. While simulating the operation of the compiler on small programs, students learnt, how very abstract concepts, worked in practice. This experiment helped me engage a large portion in the class who happily participated in the simulation. The game also provided me with immediate feedback on understanding difficulties helped me adjust my teaching style.

While teaching several lectures on data cubing algorithms at UIUC, I was faced with the challenge of helping students identify for themselves key aspects of the problem and the solutions. I designed animations that showed how three different algorithms tackled the same problem. This experiment exposed students to differences in the thinking process of algorithm designers, and by observing commonalities, the students identified key the technical challenges and the approaches used to solve them. This strategy paid off when in the mid-term exam we observed that a large fraction of students correctly chose the best algorithm to use on several real world problems previously unseen by them.

While participating on a program to introduce undergraduate students at UIUC to research, I had the opportunity to mentor two students. I was faced with the challenge of helping them find and solve interesting research problems, without imposing my views. My approach was to ask them to devise their own solutions, and through discussion, I pointed out promising aspects and difficulties of each approach, letting them refine their own method. I noticed that students worked much harder on solutions they felt as their own. We later extended this work into a joint paper that was published at a top database conference.

I try to use self assessment mechanisms throughout the semester to identify problems in the teaching and learning process. A few techniques that have worked for me are, watching the recordings of my own lectures to find presentation problems, grading homeworks and exams to detect common points of confusion, asking students to participate in class by summarizing concepts that I have just explained, and inviting friends to watch lectures and give me feedback.

I believe that one of the biggest impacts that one can have on society is through teaching. Teaching gives me access to the minds of young men and woman, and my words, actions and attitude can have a positive impact in their personal and professional development. In return I get the satisfaction of mentoring, and constant stimulation that helps my own research.