TEACHING STATEMENT

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My interest in teaching computer science comes from my belief that the field has been taking an ever-increasing role in our lives, and consequently, I find it fulfilling to educate others in such an important field. The satisfaction of knowing that my students will utilize the knowledge and skills learned from my classes to make an impact in a wide array of fields and disciplines further reinforces my interest in teaching. I find it particularly joyful to observe the progress that students make in obtaining insight, becoming critical thinkers, and gaining the ability to dissect and solve complex problems. I was fortunate to have had teaching experiences that allowed me to taste this joy.

I worked as a teaching assistant at the University of California, Riverside for 5 quarters where I managed the lab sessions for the Software Engineering class and helped teach the Compiler Construction class. My quantitative evaluations were consistently above the department averages, and I frequently received positive feedback such as “Umar is an exceptional T.A. who works hard in helping students achieve desired results in their projects. He takes his position seriously and is strict, holding you to high standards, but he provides you with the means and, if needed, help to meet those expectations. Overall, he is efficient at what he does, and I enjoyed his humor as well.” I also taught a mobile app development class at my undergraduate university, the Virtual University of Pakistan. Moreover, I volunteered to help prepare high school teachers to deliver a mobile app development class as part of the teachers’ training program at Moreno Valley Unified School District (MVUSD). Throughout my teaching experiences, I have studied and applied a set of guiding principles that have proved effective. In the following, I summarize my guiding principles in teaching and mentorship.

Guiding Principles in Teaching

Engaged students learn more; Bored students learn less. A classroom full of students checking their smartphones is a sign of boredom, which indicates that the learning outcomes are unlikely to be realized. To avoid finding myself lecturing in such a class, I have embraced a strategy of creating an engaging atmosphere through active learning. I typically design a collection of small, thought-provoking questions that I hand out to students upon the beginning of each class, and ask students to form groups to discuss these questions. Although this exercise typically takes a small amount of time, I have observed that it significantly increases students’ interest in the class content.

Critical thinking leads to strong problem-solving skills. The ability to independently analyze the facts that lead to certain truths, rather than passively accepting the truth is of paramount importance to an individual’s progress in problem-solving. I typically pose intriguing questions to encourage students to think and reason beyond accepted solutions. For example, in the context of a compilers course, rather than presenting a program optimization technique as an accepted and universal solution, I would encourage students to think about the rationale behind the design choices of this technique, when it fails, and when it succeeds.

Understanding real-life applications and implications lead to strong motivation. Oftentimes, students find it hard to appreciate academic content when explained in isolation from their real-life applications. Moreover, it is typically entertaining for students to know the story and the history behind the development of the content they study. To this end, I strive to put the concepts and principles I teach into the contexts of their real-life applications. This way, students find the “impact” of studied subjects, which leads to better motivation and commitment.

Guiding Principles in Mentoring Ph.D. Students

Personalization. Different students have different strengths, weaknesses, and goals. I believe that a one-size-fits-all approach to mentorship is ineffective. For example, some students are more productive when given more flexibility in thinking of solutions independently while some others may enjoy more intensive discussions to generate novel ideas. Thus, I believe that mentorship strategies should be adjusted based on a student’s character and goals.

Cultivating independence. Although some Ph.D. students struggle to work independently, I believe that a big part of their training should focus on preparing them to gradually be able to identify important research problems and see through their solutions end-to-end. As a mentor, I would train my students with independent research capabilities and offer sufficient opportunities for them to explore their own ideas.

Cultivating perseverance. It is not uncommon for Ph.D. students to lose motivation and get frustrated (especially upon receiving a paper rejection) at many points in their Ph.D. marathon. Therefore, I believe it is important that Ph.D. advisors can notice students’ frustration or stress and provide them with continuous support and direction.