Paul Schmitt —Teaching Statement

My goal as a faculty member is to help each student become an independent thinker and effective communicator of ideas. I try to create a setting where students realize that learning concepts and acquiring skills is a natural byproduct of asking questions and exploring solutions that are of interest to them. I attempt to foster critical, complex thinking as the next generation of computer scientists will be tasked with conquering problems of incredible scale and complexity.

My teaching philosophy can be summed up in two principles: **(1) learning is not a spectator sport**, and **(2) students respond well to high expectations**. While I am constantly learning how to be a better teacher and mentor for students, these principles are fundamental to my approach.

Learning is not a spectator sport: Students do not learn effectively by watching a teacher present slides, or memorizing pre-fabricated questions and answers pulled from a textbook and regurgitating them[1]. Rather, the process of learning is best done by allowing students the space to interact and build their own solutions to problems. The mistakes made along the way lead to deeper understanding of both the problem and the solution space. Fortunately, Computer Science as a discipline lends itself to such exploration as students can rapidly prototype software systems and solutions. While not all topics and subtopics afford themselves easily to "fun" projects or homework, most can be made relevant to students' everyday lives. Students are more engaged with material if they can relate to it and see its value.

For example, when I was a teaching assistant for network programming, I noticed the students were not excited by traditional networking course projects such as FTP servers and client socket programming early in the quarter. In meeting with the students it was clear they wanted to work on real-world, up-to-date network application protocols. Rather than using only project assignments from previous iterations of the course, I asked the students to create a social network aggregator application for the Android platform using real-world APIs and devices. The response to the assignment was overwhelmingly positive. While there is certainly a place for classic, fundamental projects, students are excited to work on problems based around "modern" systems.

High expectations: In any given group of students, some will always exceed expectations, but the majority will simply aim to meet the bar that the teacher sets. Therefore, it is critical to set high standards. The most memorable and enjoyable courses during my career as a student were those in which the teacher demanded excellence. Fortunately, in my experience most students do not simply respond to high expectations, they thrive on them. If we desire the next generation of engineers and researchers to capably solve complex problems, we must present them with the opportunity to engage in complex thinking.

It is not effective to simply require hard work. The teacher is responsible for creating a supportive environment where the students feel safe to make mistakes and ask questions. While working as a lecturer for computer networking, I offered students a means for providing anonymous feedback and asking questions that would be addressed at the beginning of the next lecture. I believe that students felt more comfortable offering critical feedback and asking more questions once they realized that I took their feedback seriously and was responsive to it.

When a teacher demands excellence, they must also make themselves widely available for interactions outside of the classroom. When I was a teaching assistant for objected oriented design, I routinely met with students outside of designated office hours. Through one-on-one interactions I could ask and answer

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[1]Scott Freeman et al. "Active learning increases student performance in science, engineering, and mathematics". In: *Proceedings of the National Academy of Sciences* 111.23 (2014), pp. 8410–8415.

questions with the students to learn their view of a problem and provide other perspectives. Allowing the students to lead the discussions led to "Aha!" moments that lead to confidence in the topic and a deeper understanding of a problem and potential solutions as the students found the answer on their own. I was also able to leverage the insight given by the students explaining their points of view in order to tailor my teaching style to better meet their needs.

As a faculty member, I am interested in teaching both entry-level and advanced courses, as through my experience, I've learned I greatly enjoy teaching both. I view general introductory courses as the place to get students excited about a future in Computer Science, while upper-level courses are rewarding as I can help students become well-rounded as they prepare to embark on careers in research or engineering. In addition to general computer science courses, my research experience enables me to teach a wide variety of special topics within networking and mobile computing in general, such as (1) dynamic spectrum access, (2) network measurement and performance evaluation, (3) a survey of state-of-the-art research in networking or mobile computing, and (4) an interdisciplinary course on information and communication technologies in resource-poor environments.

Teaching and mentoring is a unique opportunity, as contributing to students' intellectual growth is deeply satisfying. Teachers and students are codependent: as a teacher, my knowledge and mastery of a subject are deepened by the requirement of clearly communicating with students. I have a responsibility as a faculty member to help students realize their full potential to become the next generation of engineers and researchers. To maximize their potential, I am committed to remaining agile and responsive to students' needs, while maintaining the principles summarized above, to create an environment conducive to a broad range of learning styles.