Teaching Statement

In this statement, I will (1) briefly summarize my teaching experiences, (2) provide my philosophy and observations regarding specific teaching methods I have applied, and (3) highlight ways I can improve as a teacher.

I have had a variety of teaching experiences, beginning as a teaching assistant for an upper-division digital design course at UC Santa Barbara. My responsibilities were to supervise a lab section and grade student projects. The course project for the lab section was to build a 4-bit processor by combining both hardware components and programmable logic. I was passionate about the subject matter and found myself excited to pass on my knowledge to my fellow engineers.

Subsequently, I have expanded my range of teaching experiences. I have mentored both high school and university students through summer research projects, instructed middle school students in a hands-on after-school STEM program, and served as a university teaching assistant for countless quarters at multiple institutions. I am currently the instructor of record for an upper division computer science course at UC Irvine, and in my spare time I tutor local high school and college students. I consider my ability to teach others not only an opportunity but a responsibility.

I have made observations and formed opinions about different teaching methods I have explored in my courses: namely flipped classrooms and group work.

I have previously been the teaching assistant for the digital design course I am currently instructing. In the initial offerings I participated in, we presented the material first in lecture form, and subsequently required completion of interactive assignments on the topics presented. However, in the last two offerings, we flipped this model, requiring the interactive assignments completed prior to the lecture on the same topic. This flipped model allows me to challenge the students in class with more advanced applications of the covered concepts, including solving problems in class and getting immediate feedback from me and their peers. Solicited feedback from students on this specific aspect of the course has been positive. Comprehension has also appeared to improve based on grades, but we have not compared both models to classes taught in the same session. Anecdotally, classroom interaction during lecture has been more involved, with students asking more advanced questions the first time they are exposed to topics in lecture. Based on my experiences, I think overall for both students and instructors this method is worth considering, as evidenced in education literature.

Incorporating group work in computer science curriculum whenever sensible is part of my teaching philosophy I am passionate about. Being an effective part of a successful team is an essential skill for any computer scientist. Considering many will go on to work on software development teams, as instructors we should make group work a core part of any curriculum. To incorporate this into my course, I added a programming project component that required students to work in teams with a randomly assigned partner. Teams had to complete a single software project, and submit a single report together. I emphasized to my students the
importance of working and communicating effectively with strangers, and potentially individuals that they may not like. Midway through the assignment, I checked in with students individually to give each one the opportunity to communicate group issues with me privately, and to encourage communication. At the conclusion of the projects, in addition to the reports, students are required to submit grades of both themselves and their partners. I consider this at least a partial assessment of the success of each group, and it affects each student’s project grade.

I have explored popular active learning approaches in a limited capacity in past courses. For example, I have tried breaking up my lectures periodically by posing simple problems for students to solve briefly, and subsequently discuss with the student sitting next to them. The breaks were for 2 to 5 minutes and occurred every 20 minutes. In this case, student feedback was not positive. I believe this was due to the nature of the course not being conducive to this specific type of student interaction. My thoughts are that active learning is definitely not a one-size-fits-all solution, and should be applied with great care and consideration on a case-by-case basis. If I were to apply similar group activities for this course in the future, I think instead of applying them periodically between typical lecturing periods, I would dedicate an entire session to a well-defined and designed group activity. These sorts of activities must help achieve the learning outcomes in order to be applicable.

Formal assessment of teaching methods is crucial for judging effectiveness. Pedagogy is an increasingly active research area, and there is a wealth of new and exciting teaching methods in the literature. However, as instructors it is crucial that we all formally assess the effectiveness of any of the methods we choose to incorporate into our teaching. The evaluation of methods is one aspect of my teaching I would like to be more rigorous and methodical about. I think using a variety of evaluation methods available to us as instructors is important to determine the effectiveness of an applied method. Considering grades, student comprehension, and direct student feedback in combination is important.

A final thought specific to teaching university students and other adults: transparency is important. I think that as adults, students react positively when they can empathize with your decisions. If, as an instructor, you are transparent about the reasoning behind course-related decisions, it communicates your thought process to students, which generates empathy, and also displays that you have made thoughtful decisions regarding course design. Communicating your intentions also opens a dialogue for constructive comments and feedback from students and promotes trust.

The previously discussed philosophy and methods are ones I have applied and observed primarily at the university level. I also have experience with younger students from underrepresented demographics. I specifically enjoyed my experience teaching low-income, mostly hispanic, middle school girls in a STEM after-school program. I treated them as any typical student, making sure that they received equitable access by carefully considering the presentation of materials to scaffold for language and experience. The girls were perfectly capable of consuming the material designed for students at their level of experience. I was impressed with their ability to grasp basic kinetics concepts at such an early age without prior exposure to physics. This program was designed with a very interactive curriculum, complete
with physical demonstrations, group projects, and even a bridge-building competition. I think this program was an example of successful application of active learning.

I have had enough experience teaching different subjects to different types of students to know that every class is unique. University teaching often affords one person to teach different topics, even outside of their field of expertise. I look forward to expanding the topics I teach at the university level, in order to better determine which methods are appropriate and effective for the subject matter.