ELEANOR O’ROURKE | TEACHING STATEMENT

As a researcher, I am driven by a passion for providing all students with a high quality education. This passion has also motivated me to pursue a career in academia. My ultimate goal as an educator is to inspire students to tackle real-world problems that they find personally motivating. I am excited to incorporate my understanding of learning theory into my courses, focusing on interactive hands-on experiences and frequent constructive feedback. I believe that this approach will help attract a diverse body of students and build a new generation of computer scientists driven to positively impact their world. During graduate school, I have sought out opportunities to work with younger students as a teaching assistant and a research mentor. I have also taken on leadership roles in departmental mentoring and outreach programs. I describe my experience, teaching interests, and approaches below.

Teaching Experience
At the University of Washington (UW), I served as a teaching assistant for two undergraduate courses: one focusing on programming and the other on game design. First, I worked as the head TA for CSE 143, the second course in our introductory computer science sequence. My responsibilities included managing four undergraduate TAs, designing homework assignments and exams, grading, holding office hours, and responding to student emails. This experience gave me a unique perspective on the challenges of managing a large course. I also served as a mentor and resource for the undergraduate TAs, worked with students one-on-one during office hours, and partnered with instructor Hal Perkins to make curriculum-related decisions. At the beginning of the quarter, Hal and I reviewed the existing course materials and decided to modify the homework assignment on sorting to use a more interesting and accessible dataset. I re-wrote the assignment and grading test code to implement this change. It was highly rewarding to see my homework improvement integrated into the course, and this experience sparked an interest in curriculum design. My work with individual students also taught me the importance of providing interactive learning experiences, particularly in large courses. In the future, I would be excited to try novel educational techniques such as the flipped classroom to incorporate even more interaction into my courses.

I also served as the sole TA for the game design capstone taught by Zoran Popović. In this project-based class, students worked in teams throughout the quarter to design and implement their own video games. The course focused on data-driven iteration; students released their games to online portals and used the insights discovered by analyzing this data to inform their designs. My responsibilities as TA included designing assignments, guest lecturing, organizing class activities, grading, maintaining the course website, holding office hours, and setting up the server infrastructure for game deployment and data collection. Since Zoran had to travel multiple times during the quarter, I often managed the class myself. It was inspiring to collaborate with students as they worked on a single large-scale project, and to use my expertise as a game designer and researcher to help them improve their designs. This experience gave me confidence in my ability to manage an interactive project-based design class, and taught me the importance of clear communication and frequent feedback. The student games can be played at tinyurl.com/CSE481d/.

Future Teaching Interests
As a computer scientist, I would be happy to teach any undergraduate-level CS course, particularly introductory programming, data structures, and algorithms. Given my expertise in human-computer interaction and game design, I would especially excited to teach courses on these topics. I would love to recreate the undergraduate game design capstone at a new institution, and also to teach a project-based HCI course. I am particularly interested in exposing undergraduate students to the data-driven iterative design, helping them build applications that are tested by real people, potentially at large scale. At the graduate level, I would enjoy teaching research-focused courses on HCI, game design, educational technology, visualization, and quantitative methods.

Mentoring Experience
One of the most rewarding parts of my graduate school experience has been mentoring younger students. I have formally mentored two undergraduate students, both women. Mallika worked with me on the brain points project as a summer intern. She loved contributing to learning technology, and has since gone on to intern at the educational company IXL. Erin has worked with me since 2013, studying hints and tutorials in the game Refraction and collaborating on the brain points project. It has been incredibly rewarding to help her mature as a researcher, advancing from coding-focused projects to data analysis and experiment design. Her work contributed to a publication currently in submission to the Learning at Scale conference. I have also informally mentored many graduate students in Zoran’s large research group. This has taught me how to collaborate in an advising role and has led to co-authored
papers with four younger students. While my advising style varies for each student, we typically meet once per week to work through any problems and plan goals for the following week. I have found that students are most engaged when they have ownership over a project and when we define concrete approaches to help them move forward.

Over the past year, I have had a unique opportunity to mentor a large group of undergraduate students on a collaborative research project. I gave a talk on my procedural modeling work last winter, which led to a collaboration with Stuart Reges to develop new tools for the introductory computer science sequence at UW. We wanted to encourage undergraduate TAs who are experts with the course material to participate in the design process, so we advertised the project at a TA meeting. Thirteen TAs (eight women) expressed interest, and we were able to hire all of them as RAs during the spring quarter. I worked with a team of three graduate students and one staff developer to manage the RAs. We organized the students into three teams, each focused on a single problem type (expressions, if-else mystery, and array mystery). Most importantly, we gave the teams full ownership over their designs, providing assistance only as needed. We met with teams weekly, and they presented their progress to the entire research group every two weeks. The undergraduate students loved the experience, commenting that “I really enjoyed working with the grad students” and “I loved the worthwhile nature of the project – more specifically, the knowledge that our software would help people learn.” The tools developed by the undergraduate teams were introduced in to CSE 142 this summer, and are currently in use by over 300 students in the fall CSE 142 labs.

I have also taken on a leadership role in organizing mentoring within my community at CSE. I volunteered to mentor incoming graduate students during my second year at UW, and saw many opportunities to improve the new grad mentoring program. I decided to take on the role of mentoring coordinator during my third and fourth years, and I completely redesigned the program. I worked with our department chair and grad student advisor to define mentoring goals and decide how to best support underrepresented students. One change I made was to create mentoring “pods” by assigning two graduate student mentors to four incoming students. I placed each incoming female student in a pod with at least one female mentor and one other new female student to ensure that women were provided with an immediate support network. I took a similar approach for international students. I also assigned students to mentoring pods immediately after they were accepted in the spring, rather than when they arrived in the fall. This allowed mentors to answer questions during the difficult transition to grad school. These changes greatly improved the mentoring program, and this experience taught me how important it is to build a close community within computer science departments, particularly for students from underrepresented groups who may need additional support.

**Outreach Experience**

To inspire a new generation of technical experts driven to tackle diverse real-world problems, I believe it is essential to broaden participation in computer science. A central goal of my research is to develop systems that encourage underrepresented groups to engage in math. This work has given me many opportunities to participate in outreach activities with school groups, after-school programs, and Boys & Girls Clubs. One of my favorite groups is Computing Kids, an after-school program that introduces middle-school girls to computer science. Every year, I organize field trips for their students to visit the Center for Game Science (CGS) on campus at UW. I recruit female members of CGS to participate, and we give students a presentation on our work, discuss the career paths that led us to video game design, and give students an opportunity to ask questions and play our games. It is incredible to see how students open up and get excited about computer science in this environment. In addition to outreach related to my research, I have also participated in outreach events through the National Center for Women in Technology, the Association for Women in Science, and CSE summer camps for high school girls. I will continue to lead and participate in outreach activities throughout my career, with the goal of encouraging broad participation in computer science.