Jessie Garcia ♦ Teaching Statement

I was the undergraduate student who initially struggled with chemistry. My freshman year I felt uncomfortable in my new surroundings; my roommate died, it was the first time I was away from home, I didn't have the same financial support as my new friends, I was struggling to concentrate in large lectures, and, eventually, I didn't think that I was smart enough to be in chemistry. But my sophomore year things changed. My organic chemistry professor ***inspired me to believe in myself*** to achieve difficult chemistry problems. She showed me that chemistry is tough, but that there were attainable steps that I could take to learn the subject through practical time commitments and an engaging teaching style. She provided active student learning with teacher-led chemistry problems, weekly office hours, recorded lectures, student groupwork and quizzes, and encouraged students to ask questions without degrading them in front of the lecture. Ultimately, I became invested in the chemistry material because my professor was invested in her chemistry teaching. Upon graduating from Binghamton University, I received the Dale B. Terry award for senior undergraduate student who has shown the greatest improvement in chemistry. I set out to pursue my PhD in chemistry in order to become a professor and inspire other students to pursue a career in the field. With my unique understanding of how teaching practices can change the trajectory of students' careers, I defined my goals of teaching to engage students of diverse backgrounds and learning styles.

Humans are innately curious; we grow up trying to understand the world around us through touch, sight, and sound. I believe that as long as that curiosity is fostered throughout education, we can learn to think critically and acquire new and innovative skills. As a science educator, my role is to promote that curiosity into problem-solving skills. In my role as a scientist***, I aim to advance human knowledge of science, incite science proficiency, and increase underrepresented participation in the STEM workforce***. As an educator, I aim to engage all of my students by (1) using varied teaching styles with short lectures and videos, demonstration of lab techniques, and small group lab work, (2) promoting a safe and inclusive learning environment with weekly office hours and science communication via Twitter, and (3) role modeling scientific thinking.

I recognize the importance of continually updating and re-evaluating my teaching methods to ensure and support the finest quality of learning. The 21st century requires new skills and abilities as the scientific literature expands with new fields of biotechnology and chemical techniques. Therefore, we need to vary our teaching methods to solve problems with current and relevant technologies, and to support collaborative research. I adapted a required staff curriculum as a TA to the needs of my students by providing a tailored pre-lab lecture where I emphasize different components of the lab, such as the reaction mechanism or the real-world application in industry. For this reason, I implement group work and group discussions that are alternately teacher- and student-led. Students are randomly assigned a lab partner prior to each lab session and are given a chemistry problem to complete together to ensure creativity and collaboration. This could include anything from a mechanism to reading an NMR spectrum that pertains to the lab that we were completing that day. Additionally, I incorporate modern communication via Twitter about

current science research and mentorship articles. I believe it is important to connect on social media platforms to engage with more people, to expand science literacy, and to advocate for diversity and inclusion in STEM. My students are encouraged to follow my account where I interact with other chemistry educators and science journals. In this manner, I can stay connected to my students, and provide them with a secondary learning environment where they can connect to me and other science communicators without intimidation.

In my experiences as an educator, I have found that the highest measurable student outcomes derive from active learning. Adapting Paulson's (1999) concept of active learning in chemistry classrooms, I practice active participation in the laboratory and combine textbook lessons with real-world applications for inclusive student engagement and learning.[1] While I implement group activities and randomized partnering, I also like to supplement my science experiments with lessons targeted towards my students' interests to ensure that they are getting something valuable out of the chemistry instruction. The first day of organic chemistry lab, ***I hand out index cards and ask students to write down what their career goals are, and what they hope to gain from taking the course.*** I then focus my pre-labs on what my students expect to learn from me. For example, if most of my students are pre-med, I would skip the industry application of a molecule, and describe how the differences in its structure affect its function in the body. At the end of the semester, I hand back the index cards and ask for feedback to tailor my next course to better fit the needs of my new cohort of students. As I progress as a chemistry educator, I will continually make an effort to use varied methods of active student learning as well as understand how I can tailor them to the interests of my students.

1. Paulson, Donald R. "Active Learning and Cooperative Learning in the Organic Chemistry Lecture Class." *Journal of Chemical Education*, vol. 76, no. 8, 1999, pp. 1136-1140.