Teaching Statement

I am committed to teaching and mentoring, which I fully enjoy. At UGA, I have been a course co-instructor for a data visualization short course for three semesters for first year graduate students. I developed the course content (R programming, handling data, theories behind data visualization, and best practices for commonly used visualizations in scientific publishing), which is available online at my GitHub repository. The repository has been well received on GitHub, and I have received excellent reviews from the students in the past two semesters. In addition, I developed and maintained a separate GitHub repository called “Friends don’t let friend make bad graphs” that discusses best practices in data visualization. This repository is well received by the research community across the globe, starred (bookmarked) by more than 6000 GitHub users. At UC Davis, I have been a teaching assistant for five courses, three of which I led discussion sessions, where I was responsible for preparing materials and activities. From the observations that I made and student feedback that I gathered, I identified two important aspects for effective learning: 1) creating a learning environment in which students feel safe making mistakes and learning; and 2) create a learning environment that sparks joy and curiosity.

I had the realization that for students to perform well in a class, many learn through mistakes, and such opportunities should ideally be penalty-free. I worked to create an environment in which students feel safe to make mistakes, and thus feel safe to learn. I implemented this approach as a teaching assistant at UC Davis for Plant Molecular & Cell Biology (2020) and Plant Development (2021). After each lecture, I wrote a five-question quiz on the course website. The format of the quizzes included multiple choices, multiple answers, and matching. Students had unlimited attempts, but they must complete the quiz before the next lecture to receive credit. Before each exam, I also created crossword puzzles in which the answers to the clues were key vocabulary covered in lectures. Students commented that these were fun, low-stress activities that effectively helped them review course material. Multiple students also told me that without the post-lecture quizzes and crossword puzzles, they would not have gotten the grades they had for the class. Thus, providing opportunities for practice in a penalty-free manner facilitated student success.

As much as I enjoy teaching, I sincerely hope that my students enjoy learning. Therefore, I strive to create a learning environment that sparks joy, interest, and curiosity. One way to stimulate student interests is presenting real-world applications of the subject matter, for example the applications and impacts of plant molecular biology in agriculture. I incorporated examples on how genetics has been used to secure food production against plant pathogens, and how fundamental understanding of plant reproduction was leveraged to clonally propagate seeds, and thus potentially reduce the costs of hybrid seeds. Students have commented that these examples are interesting and eye-opening.

However, real-world application is only part of the answer. I argue that we can take advantage of the innately intriguing nature of biology in teaching. For example, I was a guest lecturer for Plant Molecular and Cell Biology, where I lectured on plant reproduction. Part of the lecture covered the cellular basis of ovule guidance, the process by which the pollen tubes are guided toward the ovules. I led with the question “how does ovule guidance work?” and walked my students through the key experiments and data underlying the discovery, namely laser ablation of synergids but not the egg cell abolished guidance (Higashiyama et al., 2001). Then I asked my students to deduce the biology and answer a series of Zoom poll questions. Most of the students correctly deduced that synergids but not the egg cell is required for ovule guidance. Students have commented that the many investigative activities I walked them through were fun, and that they felt enthralled by the problem-solving process. I believe the deductive process they practiced in my classroom prepared them for their future careers.

In addition to course co-instructor, teaching assistantships, and guest lecturer, I have mentored 15 lab members across a wide range of career stages (9 undergraduate students, 4 graduate students, 1 postdoctoral associate, and 1 visiting faculty) on various topics in both the wet lab and dry lab, including molecular biology, tissue culture, R programming, gene expression analysis, single cell analysis, and data visualization. My mentees/colleagues have commented that my mentoring was empowering, which brought me a lot of joy. Moving forward, I am committed to being an instructor and PI that emphasizes learning, such that students and mentees can thrive in the classroom, the lab, and beyond.