Anya L Brown: Teaching Statement

My goal as a teacher and a mentor is to elicit critical thinking, prepare students for their future career, and provide them with tools that enable them to see the world through a rigorous, scientifically-minded lens. Posing hypotheses, reading the primary literature, and engaging in experiential learning are key to understanding the scientific process; I work hard to encompass these components in my teaching and mentoring. To date, I have mentored 14 undergraduates who have all continued on to graduate school, medical school, government jobs and the Peace Corps.

Learning Environment: Learning requires an environment in which students feel comfortable expressing their ideas, making mistakes, and learning from those mistakes. I created such an environment when I taught Marine Biology at the University of Florida. For example, I presented a question (e.g., what happens to diversity as environmental stress increases?) to stimulate the students to pose hypotheses. I then asked volunteers to draw a conceptual figure to explain their ideas. Student's figures then fueled discussion and led to more refined and critical elaborations of the concept (e.g., the Intermediate Disturbance hypothesis, the unimodal relationship between increasing environmental stress, and species diversity). Because students learn differently, I also encouraged them to use creative methods to determine their best style of learning (and to make it fun!). For example, in one class, students were tasked with making a video about a phylum of their choice. Many decided to make music videos[1] that were both highly entertaining and informative, allowing students to access knowledge in an aural and visual way.

Critical Thinking: Providing students with the tools to critically evaluate science is imperative as they advance in their careers. I therefore incorporated primary literature into undergraduate classes I taught at the University of Georgia and the University of Florida. For example, in the undergraduate General Ecology lab at UGA (as well as in my Marine Biology course at UF), students were divided into groups to read and discuss a scientific paper (e.g., on salt marsh trophic cascades). Each group then selected a member to teach the rest of the class about different sections of the paper. Students gained a deeper understanding of the scientific process and learned to explain complex concepts to each other. This peer-to-peer learning exercise was a great tool, as it turned students into teachers and helped them self-identify knowledge gaps by explaining concepts to each other.

Concept synthesis: Critical thinking and the ability to make connections between disparate ideas, is essential. During my first semester at Brown University, I was encouraged to do just this in a first-year seminar on tropical ecology, and now these tenets are central to courses I develop. For example, I created a seminar at the Odum School of Ecology in which students led a discussion on an article that they thought presented one of the next big ideas in ecology. The course challenged students to evaluate which papers were the linchpins for the future of their sub-discipline. Each student led a discussion on a paper, and then wrote a summary about what made that paper an important contribution to a developing field. The other course I helped design, *Foundations in Ecology*, became a required course for entering PhD students. The course encouraged students to move out of their comfort zone by learning to think synthetically. The class incorporated field trips, paper discussions, student presentations, and modules on different topics taught by four professors in the department. An important by-product of this class was that it created strong cohort relationships among the students that lasted through their careers.

Experiential learning: Research-based experiences provide first-hand knowledge of how the scientific process works and encourages critical thinking and independent learning. You cannot be an ecologist without doing ecology. I accomplish this experiential component both with mentees and as part of field-based courses. I have co-taught field classes on tropical marine ecology in Akumal, Mexico and Mo'orea, French Polynesia. In both courses, I guided students as they identified a problem, designed and conducted research, analyzed the results, wrote a paper, and presented their findings. From these courses, several students started to help with me research projects in the field and in the lab. At UC Davis, I am excited to engage students in research in the local coastal ecosystems of BML.

[1] https://www.youtube.com/watch?v=eRpaZ4biQc8&t=69s

Mentorship: I also engage my mentees in critical thinking and facilitate hands-on learning. I am particularly interested in mentoring students from groups historically underrepresented in science. As a mentor, I conduct group and individual meetings with my mentees where we discuss papers, statistical techniques or professional development. Most students start by assisting me with my research, but later conduct a research project of their own. Currently, I am currently co-writing a manuscript with an undergraduate student based on our work on the microbiome associated with diseased corals in a coral nursery. She has already presented this project at two regional conferences and will present it at an international conference next summer. My future graduate students will be encouraged to develop their own research projects, and I will act as a guide to help them develop and refine their ideas. I plan both to mentor my own post docs in their research and professional development, as well as encourage them to seek out other mentors to help them as they navigate their career. Although undergraduates, graduate students and post docs require different amounts and types of guidance, my goal is the same: to help shape them into better scientists.

At UC Davis, I am excited to teach classes in General Ecology; Introductory Biology, particularly the principles of ecology and evolution; Marine and Coastal Field Ecology; Conservation Biology and Microbial Ecology, as well as, teach a summer field classes to provide students with hands on experience with scientific research. Because communication through writing is a vital part of being a scientist and a skill that should be cultivated early, I am eager to incorporate scientific writing in all of these classes. I will use *Writing Science*, by Joshua Schimel, to provide a common language with which I can best communicate how students can improve their writing. I am also interested in developing seminars on frontiers in marine ecology and a “Research Reviews” seminar. Research reviews is adopted from my PhD mentor, and acts as a multi-lab group meeting to discuss ideas/troubleshoot communicating difficult concepts of a research project for graduate students and post docs. I currently participate in a virtual version of this course with post docs from around the US and Canada, which has been tremendously helpful to get feedback, as I am sure it will be to the community at BML.

I plan to continue to focus my teaching and mentoring philosophy on providing students with the skills to think critically, and through a scientific lens as they prepare for their future career.