Teaching Statement|Jennifer M. Archambault|December 13, 2019

<u>My teaching</u> philosophy is driven by four primary goals for students: (1) discover their own interests through learning while deepening their understanding of basic concepts in ecological disciplines; (2) apply ecological theory to empirical observations and identify factors that complicate our simplified models of nature, while developing critical thinking skills to address conservation issues with ecological methods; (3) cultivate an interdisciplinary perspective and become adept at working across such boundaries by valuing the connections between ecology and other disciplines in the sciences <u>and</u> humanities (e.g., geosciences, history, and public policy); and (4) hone communication skills, both for professional and non-technical audiences.

Key challenges in meeting these goals for students are ensuring they are actively immersed in course content, and engaging students with intention by making content relevant to their own goals and expectations. As I began teaching in the first semester of my PhD training, I felt unprepared for these important responsibilities. Though I had been teaching in some form since my early years as a young Marine, occasionally giving what we stiffly called 'periods of instruction,' spent four years moonlighting as a yoga instructor, and had given several professional presentations, I – like many academics – had no formal training in being an educator.

Experience lacking, I taught laboratory sections for Freshwater Ecology and Biology of Fishes that first semester with the guidance of my teaching mentors and the dedication to provide good instruction. I received praise from several students at the end of the semester for great lab courses, including one student's course evaluation comment that they "thought the lab was a lot of fun and enjoyed going to it every week." I survived. My students learned. But I did not feel accomplished. I have set a high bar of leadership and excellence in most aspects of my life since my formative years (platoon honor graduate, precision knitter, productive researcher, service to profession), and I knew I had a long way to go as an educator.

In search of real training in instruction, I found the Certificate in Teaching and Communication Program offered by The Graduate School at NC State. During the 100 hours of training toward earning my certificate, I learned and practiced strategies for a meaningful first day of class, developing effective learning outcomes, engaging with diverse learning styles, managing conflict in the classroom, and structuring content using backward design,¹ among other helpful workshops and experiences. These strategies will help ensure my goals for students are met, and help me to meet a personal responsibility of fostering equity and inclusion the classroom. A common thread for creating equity and inclusion in any learning environment is to offer transparent communication for clarity and accessibility of both the expectations and the material.² In the university classroom, this is especially important for nurturing success in first-generation college students and student veterans like myself, and all students who are from traditionally under-represented backgrounds.³

One way I have addressed my goals for students is by incorporating active learning in the classroom. Studentled group discussions and immersive activities often lead to a stronger understanding than instructor-led lecture alone.⁴ For example, while advanced courses benefit from lab sections, I have designed hands-on group

¹ Wiggins G, J McTighe. 2005. *Understanding by Design*. 2nd Expanded edition. Association for Supervision & Curriculum Development, Alexandria (VA).

² Winkelmes MA, M Bernacki, J Butler, M Zochowski, J Golanics, K Harriss Weavil. 2016. A teaching intervention that increases underserved college students' success. *Peer Review* 18:31-36

³ Ambrose SA, MW Bridges, M DiPietro, MC Lovett, MK Norman. 2010. *How Learning Works: 7 Research-Based Principles for Smart Teaching*. Jossey-Bass, San Francisco.

⁴ Mazur E. 2009. Farewell, lecture? *Science* 323: 20-51; Brame C. 2013. Flipping the classroom. Vanderbilt University Center for Teaching. Retrieved 28 April 2019 from http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/.

activities for introductory course lectures (e.g., helping students learn how to identify fish from pictures and comprehend the connections between morphology and ecology). Interactive learning need not be limited to small classes or laboratory sections; modern technologies (e.g., Padlet, social media) provide a platform for peer instruction and interaction in large foundational courses to share their input in real time. Watching and listening to students discover together is rewarding for me and, more importantly, effective for them.

Engaging students with intention includes emphasizing connections to their world, including future careers, by using strategies similar to those I experienced as a student. For instance, in an environmental toxicology course I took, two teams of students researched the same chemical, drafted a risk assessment, and made a presentation defending their findings to a panel of experts (faculty). One team was role-playing a chemical industry and the other, a conservation group. Such group discovery, teamwork, and debate prepares students for interacting in a career setting, where ecologists often intersect with stakeholders who have competing interests.

Teaching and mentoring will be integral in my research group as well. As an advisor, my job is to train students to become competent scientists and effective investigators and mentors. Their successful completion of projects, including navigating the inherent hurdles and setbacks that come with research, is a good measure of my efficacy in training them. During my tenure as a graduate student and academic research staff, I have had the opportunity to mentor several undergraduate researchers in our lab, providing them technical training, career guidance, and a chance to contribute their ideas in an environment where they were valued as collaborators.

In addition to teaching laboratory sections for Freshwater Ecology and Biology of Fishes, I have guest lectured on the ecology of freshwater mollusks and environmental toxicology. My teaching experience extends to informal settings of public engagement, particularly through outreach to K-12 and community audiences. I have led lessons on macroinvertebrates and fish dissections with K-12 schools in cooperation with the NC Museum of Natural Science's Shad in the Classroom program, brought freshwater mollusk ecology and conservation issues to distant classrooms through the Skype A Scientist Program, and I was invited by the NC Museum of Natural Sciences for their monthly Science Saturday event, where I presented a talk on "Secrets of Streams."

I am prepared to teach courses on topics such as foundations in ecology, freshwater ecology, limnology, fisheries biology, environmental toxicology, global change biology, and environmental issues and policy. I would be comfortable collaborating across departments to create relevant course content (e.g., incorporating social sciences/human dimensions or environmental history into an ecology course), or spearheading an interdisciplinary approach within my department.

I want to use my experience to grow curricula as well. During the process of earning my Certificate in Teaching and Communication, I developed a course on Ecosystem Services for Ecologists. In searching for similar course syllabi, I found few such offerings, other than those geared toward economists rather than ecologists. This course will help future ecology students understand the way society may value environmental resources, and help them to connect and communicate with the public on environmental issues in a relatable way.

I view teaching as a constant learning experience of its own, and I plan to retain strategies that work well while fine-tuning my approach by taking advantage of institutional resources (e.g., Cornell's Center for Teaching Innovation), incorporating feedback from student evaluations, learning from the successes of my colleagues, and reflecting on self-efficacy. As I have done for more than two decades in formal and informal teaching settings, I look forward to continuing my journey of growth in teaching through practice and reflection.