Denise Piechnik
teaching portfolio

## Teaching Philosophy

I hope to teach courses in ecology, invertebrate ecology/biology, community ecology, biostatistics, conservation and landscape ecology. Beyond teaching the basic principles of the ecological sciences, my goal is to provide creative and engaging opportunities for students to further their critical thinking skills. My teaching approach in the classroom, laboratory, or field setting is to find ways to inspire and facilitate learning. Upon completing my courses, students will know core principles and have practice with synthesizing knowledge, while accomplishing these goals:

- independent learning and thinking
- improved problem-solving and logic skills
- practice using the scientific process
- synthesize and evaluate material
- improved communication skills.

I like to use different forms of assessment to increase my teaching effectiveness and to help students improve their learning and thinking skills. As a Plant Biology TA at UC Davis, I discovered that student learning styles vary widely. To assess whether my teaching style was complementary to the learning styles represented in each class, I periodically assigned "five-minute essays." Student summaries of the main or the murkiest idea gave me insight into potential misconceptions. By providing different examples or using different teaching methods and exercises, I reconciled my teaching approach to their learning styles. I similarly polled the class to assess study skills. Each quarter that I taught Plant Biology I quickly realized that most students needed some help with their studying practices, habits and skills. Drawing on my own experiences with developing my learning habits, I introduced a three pronged approach to improving learning performance. First I introduced learning styles and alternative study and note-taking methods, next I gave examples of study aids and different approaches to draw on their learning strengths, and finally I discussed the importance of a good learning attitude and putting forth an honest effort.

Courses I teach would develop critical thinking skills by simulating research using participatory "what if" scenarios to examine principles of ecology, to learn and practice the scientific process, and to learn how to interpret science and understand its implications. For example, mapping the topology of a river food-web on the chalkboard provides an interesting collaborative exercise to explore the river's biodiversity, trophic connections, and how to structure a research study to test for potential human impacts. Like any skill, critical thinking skills are improved through opportunity, observation and practice.

My teaching goal of facilitating learning is not limited to the classroom. I also teach research skills to students involved with my research projects. I trained and led undergraduate and graduate students in lab and field research as a PhD student at UC Davis, and our interactions were based on applying the scientific process to collect data for hypothesis driven research. I trained students in the lab and in the field by discussing the project background and the rationale

behind the research questions. I used this dialog to establish context and to guide students in data collecting methods and applying best practices when collecting and recording data. Whether in the lab or in the field, I enjoy teaching for the chance to combine my passions for teaching and research. When mentoring student researchers, I see myself as a "guide" of sorts. Mentoring student researchers requires a cautious guidance that is a dynamic balance between challenging, encouraging, and directing while creating space and opportunities for independent learning and personal development.

My approach to teaching difficult or abstract concepts involves defining the concept in the context of a well thought-out example, or in the context of application. Some students seem to respond positively to examples and prefer "real world" scenarios. My microbiology discussion students were enthusiastic about the chance to investigate and report on current events in microbiology research. After their short summaries, as a class we discussed and evaluated the media's interpretation of the implications. This critiquing exercise gave me a new appreciation for understanding the use of rhetorical fallacies in research, application, and knowledge. More often than not, students detected when rhetorical fallacies were used to misinterpret research implications.

I like to use in-depth writing assignments, such as lab reports, to assess students' deeper conceptual understanding and to improve their communication skills. Writing is difficult and a writer needs practice to improve. Yet students are given few opportunities to improve their writing by the process of reviewing, editing, revising, and re-writing. I want students to gain this kind of writing experience to improve their writing ability and to reduce their anxiety associated with tackling writing assignments. By commenting on clarity and pre-grading lab reports of my Plant Biology students, I saw students become more interested in the science and more engaged with the writing process.

Teaching is important to me, and I see my role as a guide to help students to learn ecology and the scientific process while becoming better thinkers. Students teach me of my knowledge gaps, the importance of being clear and organized, and how to be a perceptive and adaptive teacher in the classroom. I grow from these experiences and connections, and I look forward to continuing the journey of developing and honing my teaching skills and learning goals through my philosophy. Ultimately, I want students to understand the importance of ecology to their lives, but also to be able to understand scientific research, and to improve their skill in critical thinking and communication.