TEACHING PHILOSOPHY – Corinne L. Richards 5/31/07

Learning goals for evolutionary biology

Evolutionary biology is unique among the sciences in that many undergraduates enter the classroom with strong religious and cultural preconceptions about the field but few have had much exposure to the science itself. As an evolutionary biologist, teacher, and mentor, my main goal is to provide this exposure while simultaneously helping both undergraduate and graduate students to develop the analytical skills necessary to approach questions about the patterns they see in the natural world as independent scientific investigators. My job is not to challenge students' preconceptions, but to provide them with the background they need to develop a broader mindset on their own and think critically and scientifically about the processes that shape our planet and its biodiversity.

While my teaching experience has mostly been in introductory biology courses, I am excited to teach both upper-level undergraduate courses and graduate-level courses in evolution as this is the aspect of biology which I find most exciting myself. Drawing upon my own research and that of others in the field, my courses will illustrate how the method of scientific inquiry can be applied to either support or refute alternative hypotheses about the mechanisms generating patterns of biodiversity. By challenging students to apply these same steps to investigate patterns they find intriguing, whether in evolutionary biology or some other aspect of their lives, I hope to instill in them the curiosity to understand, and the ability to question how and why such patterns came to be.

Instructional techniques

My teaching draws upon the strengths of a variety of teaching methods, depending on the specific learning goal at hand. For example, lectures and directed readings are used to introduce new concepts and subject matter with which students are not likely to have prior experience. As much as possible, I strive to convey information in multiple formats (i.e., visually, orally, and in writing) to accommodate differences in student learning styles. Because I believe strongly in the value of an inclusive learning environment, such material will also be infused with examples that students can relate to their own lives, regardless of their individual background and experience. For example, a lesson on sexual selection might highlight the mating calls of a local frog species and encourage students to think about the costs and benefits males accrue by sending this signal. Many students will be familiar with the frog's call already, but those who are not will recall the lesson the next time they hear that sound some rainy spring evening.

My teaching employs active learning methods to develop students' abilities to understand and apply the steps of the scientific method to diverse problems in evolutionary biology. For example, students are sometimes given a scientific study to read and then provided with a set of questions to discuss in small groups regarding whether and how the various steps in the processes of scientific inquiry were satisfied. At other times problem-based learning techniques will be used to shape and assess students critical thinking and analytical skills. In these cases, groups of two to four students are given an evolutionary problem and assigned the task of discussing it, determining what they know and don't know about it, what they need to know to solve it (i.e., devising their own learning goals), and generating testable hypotheses.

Learning assessment

Student learning is assessed throughout my courses in many different ways. Written tests involve a variety of question types and assess both content- and process-based learning. For example, multiple choice and single sentence answers are used to assess whether students have mastered a specific concept or term whereas students'abilities to apply their knowledge of evolutionary processes to new questions is assessed via short-answer and short-essay questions. Individual and group projects, culminated by oral/visual presentations and written research paper-style reports are integral part of problem-based learning assessment in my courses as well. Feedback is provided to my students throughout the course by myself and my teaching associates as well as by their fellow classmates. Not only is frequent feedback an important component of student success, but frequent assessment of student progress also allows me to tweak my lesson plans throughout the term to better address concepts and terminology that students' appear to be struggling with. Just as I am responsible for guiding and assessing my students' learning, my students are given opportunities to provide me with feedback on my teaching to help me assess and improve my syllabus and technique as well. Students are given the opportunity to provide me with anonymous feedback at several points during the term and encouraged to interact with me one-on-one to address individual concerns or questions.

While I realize that few of my undergraduate students will continue on in the field after graduation, the analytical and critical skills that students practice in my courses will be useful both in their chosen careers and in their daily lives. I do, however, hope to inspire in some of my undergraduate students the curiosity and excitement I feel for evolutionary biology. For these students especially, as well as students in my graduate level courses (who have already been "bitten" by the evolution bug), I look forward to serving not only as a teacher, but also as a mentor and eventually a colleague as they develop into independent thinkers, and skilled researchers and teachers.