Teaching Statement

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Philosophy

Learning is a life-long adventure that provides us an opportunity to investigate, critically contemplate, and appreciate the beautiful and dynamic world that envelops us. As a learning facilitator, my goal is best articulated in the writing of Ebert-May and Weber (2006): "to encourage and create a learning environment in which all students are actively engaged in the process of scientific thought and reasoning." As a learner, I am responsible for actively constructing my understanding by integrating new information with my existing knowledge. Therefore, in class meetings, laboratories, and one-on-one interactions, I aim to inspire students' curiosity, cultivate their creativity, and hone their cognitive and metacognitive skills so that they become effective problem solvers and life-long learners.

I use a combination of instructive and constructive techniques to implement my teaching goals. Lectures and guided readings are important tools to introduce subjects and raise questions because they help students rapidly build their knowledge base. In class, I attempt to present material in novel ways and respond to students' interests. I use short vignettes to convey concepts along with my amazement at the natural world. I also work to connect the material to current events and other subjects the students are studying. However, my experience confirms studies reported in the literature that suggest active learning experiences are more effective in promoting curiosity, self efficacy, and learning. Thus, I employ a variety of active and constructive teaching methods including practicing scientific inquiry, writing, modeling, and fieldwork.

Scientific inquiry is a formal process of asking questions and then systematically searching for answers. Discerning questions lead to good scientific research and effective learning, so I model the inquiry process by liberally questioning students about course material and challenge them to ask their own. This switches the learning activity from a passive mode into one of active engagement in which the students are in control. This makes the classroom more learner-centered and empowers students to continue their learning outside of the classroom.

Writing is a key constructive technique and a critical form of communication. What we know or discover is irrelevant if we are unable to effectively communicate it. Further, I agree with my college professor Bart Dredge who argued that "we write to think, not think to write". It is in the recursive writing process that our ideas solidify, our logic clarifies, and our learning is constructed. Good writing is evidence of clear thinking. However, writing and the requisite critical thinking are skills that require practice and feedback to develop. Thus, I ask students to write frequently—in minute papers, laboratory reports, research journals and papers—and I strive to provide rapid constructive criticism regarding both style and content.

Modeling is in many ways like writing. It is another tool to guide and communicate our thinking, and it, too, is best learned through practice. I envision teaching a course devoted to ecological modeling and systems analysis, but like writing, modeling can infiltrate other aspects of the curriculum. In graduate and undergraduate courses I have taught, I incorporated short exercises that required students to construct conceptual models of various kinds (e.g., kinematic graphs, concept maps, propositional logic). The students' response was amazing. They typically enjoyed the activity, were forced to analyze and synthesize topics in new ways, and they were then able to share and compare the alternate representations of their knowledge and understanding. The next step of quantifying conceptual models and encoding them as computer programs for simulation and analysis requires students to clearly understand the biological and ecological concepts and practice creative problem solving skills.

Finally, many elements of ecology and environmental science are best learned through kinesthetic experiences in the field. Digging through salt marsh sediments, walking through a forest, peering at and between cactus needles, smelling wetlands, tasting fruits, listening to birds singing, overturning rocks in stream riffles, and visiting waste treatment facilities all generate new understanding and long-term memories. By entering into ecosystems we often unearth connections with abstract concepts and the physical locations. Within these places, we can ask interesting questions, write, and create better models.

We live in an age of information, where the data explosion can produce overload and paralysis. Whether as ecologists, environmental scientists, business people, government officials, or industry leaders, students must learn to effectively research, manage, analyze, synthesize, evaluate, and act upon this constant stream of information. My goal is to help students' develop their ability to do so, and along the way help them discover the pleasure of learning and the relevance of the natural world. Let the adventure continue!

References

Ebert-May, D. and R. Weber. 2006. Course Website for ISB 202: Applied environmental science and organismal biology. Michigan State University. http://www.msu.edu/course/isb/202/ebertmay/home.html