

Statement of Teaching Philosophy

It is the mark of an educated mind to be able to entertain a thought without accepting it. – Aristotle

Framework

My goal for teaching is to create an environment that facilitates and allows students to question, and critically evaluate the world around them. Critical thinking, problem solving skills, and data analysis, are essential for students in environmental science to learn *how* to think rather than *what* to think. However, students must have a comfortable, respectful, and non-threatening classroom and learning environment, in order to fully express their views. Therefore, I strive for an enthusiastic and welcoming environment in the classroom and laboratory, and continually explore a wide variety of teaching approaches to accommodate students' diverse learning styles and to motivate them to connect with environmental science.

Goals for Student Learning and Role of Student Identity-Diversity

Critical thinking is something that *can* be learned in a systematic way through evaluation and understanding of arguments. A critical thinker must be able to evaluate what points another person is making – whether that be in class or in something they read in the newspaper over breakfast – then they must be able to break down arguments into component parts and determine whether that person's points are valid. In this way, students can determine for themselves whether they should accept another's point of view and not blindly accept information presented to them. For example, in a course that I teach about global change, I use the divergence of viewpoints that surround this issue as a tool to facilitate evaluation of arguments. Students are purposefully broken up into two groups based on their level of confidence in whether global climate change is occurring – more confident students on one team and more skeptical students on another. Then students are asked to role-play and argue the position of the other group. In this way, students have to challenge themselves to think critically about why other people may or may not believe climate change is occurring.

Problem solving skills are also crucial to the learning process in environmental science. Students must be able to systematically evaluate a problem using quantitative and qualitative analysis of data to explore potential solutions. Since environmental problems generally involve complex systems that cross multiple disciplines, students also must be comfortable working with students (and faculty) from diverse backgrounds and across disciplinary boundaries to develop concrete solutions. To facilitate this, I make an effort to structure classroom activities so that students can work and brainstorm in groups with people that have diverse backgrounds. For example, students that are interested in, or majoring in, different fields are purposefully placed into the same discussion or project group to broaden the scope of the thinking and problem solving skills. This often facilitates "thinking outside the box" and creates solutions to problems that may otherwise be overlooked by a group of students from the same disciplinary background.

Enactment of Goals

Although standard techniques such as lecturing and classroom discussions are fundamental to the learning process, many students in the sciences seem to thrive with hands-on, active learning techniques. Therefore, in addition to lectures and class discussions, I utilize applied learning with data collection via environmental monitoring equipment, quantitative and conceptual models, and spatial and mapping programs, to help students better understand complex environmental systems and cycles. Students also benefit from discussions and problem solving activities with their peers so I employ small group discussion, role-play, and problem solving sessions. Students are often broken up into small groups to look at different aspects of a problem or topic, and after a period of time, they are then asked to share their groups' insights with the whole class. The jigsaw puzzle method, where students independently explore pieces of a problem and then come together to talk about how the whole picture fits together, has also been an important tool in my teaching. Students seem to feel a sense of importance and responsibility using this technique because if they do not do their part, the whole group suffers. In my experience, students connect to science in the most effective manner when they can see it's relevance and importance to their own lives. Therefore, I strive to help students understand how science relates to their everyday experience through engaging lectures, discussion, as well as, classroom and laboratory activities.

I feel that students should be evaluated regularly throughout the course in a number of different ways to accommodate the diversity of students' strengths related to the learning process. Throughout the semester, I assess a variety of activities including lab activities and write-ups, short thought pieces on discussions and reading assignments, class participation, oral presentations, as well as several exams. I also feel strongly that students in the sciences should be able to read, write, and present scientific information, in a clear and effective manner. Thus articles and research using the primary literature are generally incorporated into the class curriculum through discussion assignments and a final project. It is also important that students' difficulty with topics be addressed. Therefore, periodically I ask students to anonymously write down things that they are unclear about, or uncomfortable with, and I make every effort to address these issues accordingly. By diversifying my evaluation of the learning process, those students that may not perform well in one situation, such as under exam pressure, can still demonstrate their understanding of the material and excel in the course.

Summary

In conclusion, my primary goal for teaching is to facilitate critical thinking and problem solving skills through environmental science curriculum and evaluation of real world problems. It is also important that students collaborate across disciplinary boundaries to investigate complex environmental systems. To develop these goals I employ active learning techniques that involve a variety of collaborative problem solving techniques. I also and strive for an inclusive and enjoyable environment in the classroom, and employ a variety of teaching approaches to accommodate students' diverse learning styles and to motivate them to connect with environmental science.