

## **Andrea Walther's Statement of Teaching Philosophy**

My desire to teach biology at the college level originated during my undergraduate education at Ohio Northern University. Though I have always had a deep-seated interest and appreciation for science, interactions with my knowledgeable, enthusiastic undergraduate biology professors are what motivated me to pursue teaching. As a graduate student at the University of Michigan, I have taken great strides toward becoming an effective and proficient teacher, primarily by serving as a Graduate Student Instructor (GSI) for several different courses and by participating in college teaching seminars offered by the university's Center for Research on Learning and Teaching. These experiences have been critical in enabling me to develop goals for student learning, to explore various teaching methods, and to examine means for evaluating student learning.

As a biology instructor, I aim to instill in my students an appreciation for the field of biology by having them connect it to their own lives. Regardless of the specific subdiscipline I am teaching, I encourage my students to construct a framework of key vocabulary and concepts, which they can then use in related courses, their future professions, or their daily lives. It is essential that my students learn the value of the scientific method in advancing science and that they develop their own critical-thinking skills by asking scientific questions, formulating hypotheses, and designing experiments. To further develop these skills, they must also learn to critique the scientific work of others. I realize that all students are different in terms of their background, abilities, interests, and career goals, and I eagerly cater to this diversity, but for a student to benefit most from the biology courses I teach, these fundamental objectives should be met.

To help students develop an appreciation for biology and think about how it relates to their own lives, be the subject the environment, genetic engineering, biodiversity, or health and medicine, I often incorporate personal anecdotes into lecture and have my students do the same. This frequent exchange during class helps get the students thinking about the practical applications of the subject and makes them more receptive to learning about the field. As an example, when I taught Animal Diversity, I kept live marine invertebrates in the lab, and students enjoyed sharing accounts of which marine animals they had actually consumed at one point or another in their lives. I encouraged individuals from different backgrounds to communicate their experiences, so that not only did I teach my students the classification, ecology, and anatomy of the organisms, but they also learned about the animals' cultural significance.

Much of biology, especially in introductory courses, might be considered rote learning and can intimidate those students who are less invested in the field or who have difficulty with memorization. To help students remember pertinent vocabulary or scientific names, I introduce them in terms of their roots when applicable and then relate them to a broader context. For example, when introducing Ctenophora in Animal Diversity, I explain that "ctena" means "comb" in Greek, and "phora" is from the Greek term for "bearing." I might then show a picture, video, or preserved specimen and explain that these animals, the comb jellies, bear "combs" or ciliated comb plates with which they swim through the water. I also ask the students if they can think of any other terms they have learned in class that use either of the root words of Ctenophora to encourage the constant application and review of older material. To teach my students some of the important concepts in biology, I require that they read background material before lecture, and at the beginning of lecture I informally quiz them to see which concepts they had the most trouble grasping, and we focus on those more difficult concepts during class. I also use group activities, such as the think-pair-share approach, to support active learning of concepts during class.

To familiarize my students with the scientific method, I introduce the steps involved in this process at the beginning of the semester and, by discussing relevant influential studies, note the value it has had in advancing scientific knowledge in the subdiscipline I am teaching. I give the students the opportunity to ask and address their own scientific questions by having them write papers in which they utilize the scientific method. These papers are completed in small groups to promote collaboration among people

with diverse perspectives. I also have my students exercise their critical-thinking skills in class by having them work in teams to critique peer-reviewed scientific papers.

I use various means of assessment in class to determine whether my learning objectives are being met. I gauge student interest and appreciation of the subject just by the level of participation and energy students convey. To determine how well my students are grasping the vocabulary and concepts important in the subject, I informally quiz them on preparatory readings at the beginning of class and periodically administer formal quizzes with fill-in-the-blank, multiple choice, and short essay questions. Midterm and final exams test how well the students are able to use the basic material they learn in a larger context. Finally, to assess how my students' critical-thinking skills are developing, I consider how well they have applied the scientific method in their group papers, and I oversee their in-class group critiques of others' papers. This latter assessment method also enables me to evaluate whether my students are able to contribute to constructive scientific dialogue.

By focusing on the student objectives described above and implementing the teaching strategies and assessment tools I have outlined, I feel that I have been successful as an instructor thus far. Many of my students have expressed satisfaction with my approach to teaching and the amount and quality of the information gained under my instruction. Because I realize that I have not yet reached my full potential as an instructor, I look forward to testing even more educational approaches and becoming more adept at serving my students.