

TEACHING PHILOSOPHY

I have several principles that guide my approach to teaching and curriculum development, and thus shape my pedagogical philosophy. In all cases, I believe that these principles allow me to increase understanding, engagement, confidence, and excitement for science in my students.

1. A caring, patient, and personal approach to instruction allows students to gain confidence in their own abilities and thus build the tools necessary for their success.

I often encounter students who suffer from science/math anxiety or are facing significant personal issues which affect their self-esteem. My approach to working with these students is to show empathy, caring, and patience, and work with them one-on-one to help them better understand the problem at hand. Having someone work with them step-by-step, and actually *express belief in their abilities* can be incredibly powerful. Taking a personal approach to instruction also means getting to know my students. On the first day of class I have students share their pronouns; career interests; and what they hope to get out of the class. I then tailor my teaching to these interests. I genuinely want each student to be engaged and succeed and am personally invested in their success.

2. A multi-modal approach to both teaching and assessment engages the highest diversity of students, and allows for the greatest variety of students to succeed.

Taking a personal approach to instruction also means realizing that not everyone learns in the same way, and so I try to teach and explain the same concepts in different ways to try to engage every student. I supplement traditional PowerPoint lectures with videos, white-board drawings and writing, time for working on worksheets, group discussions, and active engagement with biological specimens. I am a strong proponent of active learning. For example, in giving a lecture on turtles, what better way to illustrate the evolution of the shell than to allow the students to gain hands-on exploration with the turtle shells that we have in our teaching collection? I also apply a multi-modal approach to assessment (quizzes, presentations, discussions, writing, hands-on activities, etc.), that emphasizes a growth-mindset and that everyone learns (and demonstrates their learning) differently.

3. Allowing students to take personal responsibility for their learning increases the sense of ownership they have in their education, and, through teaching others, increases their own knowledge and confidence in the subject matter.

The traditional lecture style of teaching encourages passive, not active, learning. Some of this can be combated by increasing active learning opportunities in the classroom, such as described above. Another method is to allow students to take personal responsibility for their learning *outside* of the classroom, and then bring that back to the classroom to share with others. In all my classes I ask students to participate in both learning and teaching, as I believe that teaching others is the best way to understand material. I often ask students to work in small groups to independently research and present to the class information on a particular topic; and major projects are usually completed in an independent and highly tailored fashion. Students in both my upper and lower division courses learn how to devise, plan, and complete independent hypothesis-driven research projects and engage in term natural history projects that are completely unique to them as individuals, which increases a sense of ownership in their own work. To take personal responsibility of learning to the next level, I also actively “flip” the classroom, especially in courses that focus on quantitative skills where teaching is best done through active working of problems with assistance from the instructor.

4: Allowing my enthusiasm for my subject area to shine, and incorporating my own research into my teaching, can be the best way to excite students.

I genuinely love the subject matter that I teach, and I try to distill this enthusiasm and amazement for the natural world into my teaching. Having an enthusiastic instructor can be infectious. I genuinely want students to feel as excited about the natural world as I do! One of the best ways to engage students in the material I teach is to show them that I am also a scholar of this same material. Too often I feel that students become disconnected from the human process of scientific discovery, and see science as something that “someone else” does, instead of people all around them. In all my classes I try to incorporate my own published research into my lectures to use as examples of certain topics I am teaching. I find that students are highly interested and engaged by these examples, as they make the science come alive.

5: Showing students that science is a real, living, human endeavor, by introducing students to the process of science, engaging in laboratory or field experimentation, research methods, reading the scientific literature, and communicating with scientists, not only makes biology come alive, but is also critical to a scientist’s education.

Students learn biology best by actively engaging with the process of biology research. In all classes, from BI 101 to 474, students are introduced to research methods, tools, and techniques. These hands-on activities teach real, research-quality methods that students can put on their resumé. For example, I have had students apply for jobs at the Oregon Department of Fish and Wildlife listing the field survey techniques they learned in BI 317, and one former student was employed by a local microbiology company in large part due to her knowledge of the research-grade open-source statistical software package “R” that she learned in BI 343. I also introduce students to research skills in the field by having them directly partake in my research through high-impact CUREs, collecting data at my local research sites. Learning real, practical research skills, and putting those into practice by participating in actual faculty research makes the science come to life. Students also gain an understanding of the process of science through engaging with the scientific literature and meeting the authors of the papers over Zoom or in person guest lectures. This also allows important networking opportunities for students. In one case so far, this interaction directly resulted in a student ending up starting a research collaboration with the scientist based on a question he asked in that class Zoom session, and the student is now conducting an MS degree with that scientist.