

Statement of Teaching Philosophy

Scientific literacy is a critical skill for navigating our world. Whether through media or informal conversations, we are confronted with scenarios that require scientific literacy skills such as identifying valid arguments, interpreting data, and justifying conclusions. These skills are transferable outside the classroom and are appropriate goals for teaching large introductory biology classes where students have diverse backgrounds and diverse career goals. My own teaching-as-research project and the work of others has shown that we struggle to teach students science literacy skills. Thus, my teaching aims to center science literacy through (1) cooperative learning, (2) inquiry, and (3) reflection focused on keeping content relevant to real world applications and scenarios where students may need these skills in their everyday life or their future career.

In my teaching, I aim to use cooperative learning to introduce students to working collaboratively, as scientists do daily. First, I designate students into groups throughout the semester to build a classroom community. These groups provide an important support structure to students, especially if students are taking their first college biology course, but student groups are not inherently cooperative. I incorporate cooperative learning through activities that require students to be responsible for their own work and to work together to create a final product. I have implemented cooperative learning in activities designed to have students practice using backward design to develop lesson plans and to summarize data analysis strategies for quantitative and qualitative data. I have also developed a cooperative learning activity where students must collectively decide how to spend a research budget to answer their individually assigned research questions. In each case, students within a group are assigned specific roles while they need to work together to produce the final product which may vary from a short verbal summary to a written report.

While inquiry is often used to support concepts introduced during a lecture, I aim to use inquiry for discovery that is later reinforced through lectures, discussions, and homework. I have developed a series of inquiry-based activities where students use checkers to represent alleles and they ask questions and test them to identify how natural selection, genetic drift, and migration can lead to evolution. I also aim to emphasize inquiry in my classes through independent research projects that provide students autonomy over their learning to apply the course material to their interests. In both large and small inquiry activities, students must use their science literacy skills to present their findings to their peers including graphical representations of data and conclusions supported by their findings.

Students in college classrooms have unique prior experiences they bring to the classroom. To effectively build science literacy skills through cooperative learning and inquiry, I do not assume students enter the classroom having already learned skills in prior courses. I aim to explicitly teach skills that it is often assumed students already know such as how to interpret different types of graphs, how to read scientific articles, and how to be effective group members. Incorporating these scientific literacy skills into my classroom ensures students have been taught the skills needed to succeed in my course.

My role as an educator also includes teaching students about learning. I have increasingly observed students in the classroom who are discouraged when they struggle with the material and/or have not learned studying skills. I aim to introduce a growth mindset and studying strategies during class that are reinforced with guided reflection assignments throughout the

semester. Promoting a growth mindset in the classroom in addition to active learning has been shown to improve learning outcomes of marginalized students. Learning takes time and effort, just as scientific discoveries take time and effort. In particular, I will incorporate a reflection question at the end of each exam asking how the student prepared for the exam. When exam grades are released to students, there will be a follow up reflection assignment asking students how effective they feel their studying was, what strategies we have discussed in class they might use next time and evaluating student growth mindset. The data collected through these assignments will inform changes to my teaching to ensure I am achieving my goal of increasing student growth mindsets.

My goal as an educator is to center science literacy skills through cooperative learning, inquiry, and reflection. My role in this process is to guide students through activities focused on content application with frequent feedback. With these teaching practices, students leave my classroom with knowledge and skills they can transfer to their everyday lives and their future careers.