

Spark students' curiosity through innovative, impactful, and inclusive teaching

My overarching goal as a teacher is to develop innovative ways to spark curiosity in students, regardless of the specific subject being covered. Reflecting on my own experiences as an undergrad, I "learned by doing" via laboratory tasks, presentations, and writing assignments, rather than memorizing and regurgitating information. Some of my most effective instructors combined different types of activities (class brain-storming, group break-out sessions, debates, games) to gain a deeper understanding of the material. Such "active learning" has been demonstrated to increase student test scores¹ and student perceptions of their own learning².

Teach students how to learn: I believe that teaching should incorporate approaches that help students to learn more effectively (i.e., to learn how to learn). The methods that work best for one student may not be the same as another. However, the meta-cognition required for students to figure out exactly which methods work best (and which ones do not) takes time³. One solution implemented in a first-year biology course I taught for four terms (BIO120) involved iterative assignments, whereby students were given the opportunity to incorporate feedback on a written assignment they passed in previously, meaning that their overall grade for that assignment was based both on the quality of the assignment itself, in addition to how well the feedback was incorporated. Additionally, I've designed teaching materials that guide students through the process of learning how to read primary research articles and give effective scientific presentations, which I'd be happy to provide to the Search Committee if requested.

Teach transferable skills: I've had the privilege of teaching subjects that excite me to my core, and based on student surveys, my enthusiasm seems to have rubbed off on several of my students. However, not all students will work as biologists, and many have interests completely outside of my field of expertise. One of my main priorities is to package course learning objectives into skills that students can use long after the course is complete, including more effective communication (i.e., written and oral), critical thinking, and interpersonal (i.e., working effectively in a team). Specifically, in the course I am currently teaching, I introduce the basics of data analysis using R, guiding students to use datasets they have chosen to conduct general(ized) linear models and test predictions using post-hoc comparisons. Although the syntax is R-specific, students become more familiar with the logic behind the code, emboldening them to utilize other programming languages (e.g., bash, python). These computational skills will prepare students for conducting their own independent research, and open the door to data science and analytics more generally.

Teach inclusively: I strive to create a learning environment where students feel emboldened to ask questions and share ideas in a variety of ways (e.g., classroom, office hours, course blog or forum). Varied assessments help students of all learning styles, and featuring diverse topics/examples as well as biologists of all backgrounds help make course material more relevant for all students. For example, as an introduction to phylogenetics, students were required to watch a video by the prominent evolutionary biologist Dr. Pleuni Pennings who discusses how biologists can use phylogenetic trees to address questions important in human society, such as assessing the level of community spread of the novel coronavirus. I additionally emphasize the historical context within which biological ideas are formed, and am transparent about the "dark side" of the topics we discuss. For example, I included a unit on eugenics and other controversial research that attempts to quantify the genetic basis of human traits, including intelligence. Although these topics are highly sensitive, it is imperative that students understand the dangers of pseudoscience and are given the tools they need to debunk many of the harmful claims made in the past and current times.

References

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