OVERVIEW

In my teaching I aim to create an environment in which students feel capable and confident to learn. I also teach to promote learners who can understand the biology of the world around them in order to make informed decisions as members of their communities. My teaching practices rely on a variety of tools to engage students in real world, inquiry-based activities, both in the classroom and laboratory. My enthusiasm for teaching and learning is cyclic. I am fascinated by the ways in which microbes transform their environments, and this curiosity is spread to my students as we engage in the classroom and lab. They become interested in new topics, ask challenging questions, and that leads me to pursue new topics which resets the cycle. Thus, my research informs, and is informed by, my teaching. I look forward to the opportunity to engage the diverse student body at Middlebury College by bringing my excitement for teaching and accessible course design to the biology curriculum.

EFFECTIVE AND INNOVATIVE TEACHING PRACTICES

Accessibility and diversity are very important to me, and I seek to make my classes accessible to a wide variety of learning styles, and to students with diverse backgrounds. I view the variety of learning styles and student backgrounds as an asset to my classroom. An inclusivity statement in my syllabus conveys this, and I also take care to address what I mean by inclusivity on the first day of class, and reinforce this principle throughout the course. In my courses students and I lay ground rules for making sure everyone feels encouraged and able to share their opinions and ideas. Diversity within academia is a worthwhile pursuit simply for the reason of equity, but it has the additional benefits of exposing students to broader perspectives and sharing experiences from different backgrounds.

Student engagement and motivation are fundamentally linked to teaching methodology. I strive to implement teaching strategies that not only engage students, but also develop their ability to think critically across disciplines. As a teacher it is paramount to have open communication and interactions with my students, both with content and through assessment. In class I use a variety of methods that support student learning. A brief introduction of the days’ learning objectives with “think-pair-share” questions can help students identify and review misconceptions; small group discussions or assignments allow students to analyze and synthesize concepts from readings. Question and answer sessions allow me to evaluate which concepts students already grasp, and those which need more attention. These various teaching methods are directly aligned with my assessment techniques. Case studies, problem-based learning activities, and low-stake writing assignments help students comprehend and apply subject material. Practical lab skills, notebook checks, and practical exams are methods I’ve employed to make sure students are able to independently execute certain lab skills, and also think critically about what those results mean. In addition to these formative assessments, summative assignments include lab reports, term papers and quizzes. I find it helpful to give frequent feedback, especially early on in a course, and also to allow students time to reflect on what they have learned and how they have learned it. One successful tool I’ve implemented in my classes is passing out a notecard and having students write three things which they then turn in to me. First, they write a brief application of a topic we have covered that day, secondly they include something about the topic that is still unclear or confusing to them, and finally they write down something that worked well or could be improved for their learning in class that day (i.e. “I should review the learning objectives for the day prior to coming to class”).

At Sage College at Albany I taught a biology elective course titled Environmental Issues. This class challenged me to prepare materials that met the needs of the students pursuing seven different majors spanning the age range of freshmen to seniors, from biology to business management. By implementing a team-based learning approach, I used the diversity of backgrounds and interests among the students to foster discussions on topics ranging from biodiversity to energy policy.

Inquiry-based learning is central to my teaching, and I use it to help students think critically and independently. When students are presented with concepts in context it enhances their engagement with the subject matter, and influences their ultimate learning of the material. Ideally, the context provided is

---

relevant to current research, and ties in to research gaps or controversies within the field. I have found that independent lab-based projects provide an excellent opportunity for students to engage with the scientific method and genuine inquiry-based learning. Students are asked to explore primary literature research, and generate a hypothesis based on a current research gap. We chat informally a few times about their ideas, which are then written up in a formal proposal that allows me to provide more substantive feedback. They then carry out their proposed research, present a poster to their classmates, and write a written report in the style of a journal article. This allows them to design a project of interest to them, think critically about the topic, and present their data to develop important scientific communication skills. Writing is critical to scientific communication, and my courses provide structured opportunities to utilize and improve these skills.

TEACHING EXPERIENCE

My passion for teaching started 10 years ago as an undergraduate TA in microbial ecology courses at Hampshire College. I enjoyed helping my peers find strategies to work through common misconceptions and complex materials. Since then I have received formal training in teaching through my experiences as a graduate TA, and in workshops and courses on evidence-based teaching. I have continued to improve my teaching skills through recent appointments as adjunct faculty at RPI and Sage College at Albany, and now as a visiting assistant professor at St. Lawrence University. In end of semester evaluations, I consistently receive above 4.5 out of 5 on questions related to my enthusiasm for teaching, communication, interest in helping students learn, and clear explanations.

The microbiology courses I taught at RPI and Sage College provided some of my best and worst teaching moments. Teaching at RPI gave me the opportunity to design and implement my own syllabus. This allowed me to apply my knowledge of backward course design to incorporate an assortment of active learning opportunities to address my learning objectives and goals. The course at Sage College was one in which, in order to have 6 consistent lab sections taught by four faculty, both the lab design and syllabus were set by one instructor. I found it difficult to help students tie together concepts from the lecture portion of the course to the cookie-cutter labs, and the student motivation with the coursework was much lower. It has re-emphasized the need to make materials both innovative and learner driven. The RPI students, who were progressively challenged with authentic tasks, showed clear progression in critical reasoning and experimental design skills. In addition to their independent projects, in a journal club discussion, they readily dissected and critiqued a somewhat flawed primary literature article, and designed well thought-out follow up research that should be conducted to improve the experiments presented by the authors.

Currently at St. Lawrence University I am co-teaching an introductory microbiology class with a lab. With small class sizes, and an emphasis on strong liberal arts background and communication skills, this course mirrors Middlebury’s educational philosophy. We reinforce content through a variety of low- and high-stakes assessments that highlight critical concepts. In addition to covering pertinent scientific background information, we emphasize discussion of primary literature, and learning through independent lab-based projects. Recently in class students learned about historical medical microbiology through famous works of art that depict the plague and tuberculosis. By using interdisciplinary approaches my colleague and I aim to expose students to the material from many angles, and ultimately help them build stronger and lasting connections with the material.

TEACHING REFLECTION

I am cognizant of the need for my teaching methods to continue evolving. I value metacognition about my teaching and assessment methods, and strive to stay up to date with pedagogical teaching methods. It is important to me to self-assess, and seek assessment from colleagues and students, to understand the effectiveness of my teaching. Additionally, I continue to pursue opportunities to learn about the newest research in evidence-based teaching through publications and services offered through teaching conferences and centers. I am excited by the opportunities that Middlebury’s Center for Teaching, Learning and Research provides to the faculty. I anticipate utilizing their services to continue my professional development with teaching practices.
I am passionate about liberal arts education, and the opportunity for interdisciplinary collaboration among students and faculty. I am well suited to teach a variety of courses at introductory and upper levels in ecology and evolution, microbial ecology, environmental virology, as well as molecular microbiology and genomics. I’m excited by the opportunity to teach a lab-intensive Winter Term course in molecular microbial ecology. Winter Term provides ideal timing for a methods-heavy course, in which students gain exposure to a variety of different techniques, and then immediately apply these methods to research projects of their own design. Additionally, I look forward to teaching in the First Year Seminar Program. Microbial ecology is ripe with intriguing topics, from the gut microbiome and health to the extreme organisms living at pH 1, these topics provide a great starting point for students to develop skills in critical reading and writing. I am confident that I can prepare Middlebury College students who are motivated critical and independent thinkers, with practical scientific skills, both in the lab and classroom, and beyond in their broader communities.