

Teaching Statement – Morgan Carter

Overview

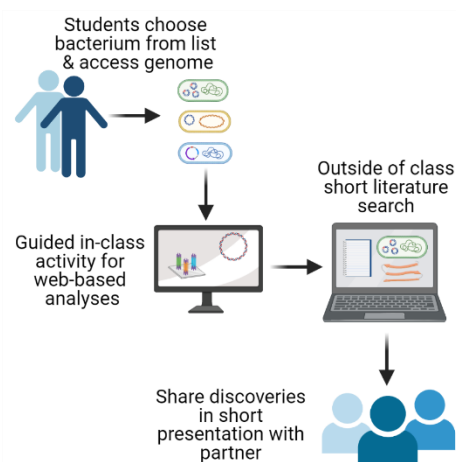
I aim to create a welcoming learning environment that is accommodating of student needs and goes beyond test-centered lecturing, focusing on active and problem-based learning. In classrooms, I use interactive lessons and hands-on projects to provide context with content and push beyond rote memorization. I love informing and inspiring others through teaching, but also updating my own knowledge and frameworks based on revisiting material with the fresh perspective of students. Thus, I see teaching and learning as a partnership and respect my students' contributions. **My teaching experience has focused on biochemistry, molecular biology, and microbiology courses, while my research areas incorporate mycology, genetics, and symbioses, making me an asset for teaching a wide variety of courses within the Department of Biological Sciences.** Below I detail my experience, classroom methods, and teaching interests at UNC-Charlotte.

Previous Experience:

Each classroom I have been a part of, as a teacher or a student, has contributed to my ideas about what is needed for successful knowledge transfer and retention. My introduction to pedagogical training was completing the “Introduction to Evidence-Based Undergraduate STEM Teaching” course offered by the Center for Integrated Research Teaching and Learning (CIRTL). Since then, I have developed four guest lectures in colleagues' courses and co-led a workshop on Genome Editing in Hyderabad, India, with the Cornell Alliance for Science. As a student, I served as a Teaching Assistant (TA) for five semesters, seeking out assistantships that allowed me the flexibility to design my own review sessions for additional practice at teaching. When unable to incorporate more active teaching experience while on fellowship, I attend trainings and reading groups to expand my knowledge of evidence-based teaching practices, a selection of which are listed on my C.V.

As a postdoctoral researcher at the University of Arizona, I have taken workshops offered by CIRTL and other campus teaching programs, including completing an online course on Inclusive Teaching and participating in a Faculty Learning Community (FLC) reading group focused on Learner-Centered Teaching (Weimer, 2013). Within one year, I earned two certificates for teaching skill development, based on a submitted ePortfolio that can be found on my website. As part of this, I **voluntarily co-taught a graduate level Principles of Plant Microbiology course in Spring 2021 with Dr. Betsy Arnold**, contributing four new lectures, facilitating six paper discussions, and developing a bacterial genome analysis module.

The module is an example of learning activities I like to develop as it guides students' use of web-based tools to access and analyze a bacterial genome selected from a curated list of species. By presenting their work with a partner on “their” two genomes to the class, their discoveries became a more impactful way to learn about different species of plant-associated bacteria compared to a traditional lecture. This module is available on my website for others to use and can be adapted to future courses I may teach including using eukaryotic genomes and slightly different web-based analyses.



Synopsis of Plant-Associated Bacterial Genome Investigation module.

Using my own pedagogical training history and co-teaching experience, I led the creation of an “Accelerated Postdoctoral Pathway” teaching certification program for CIRTL@UArizona. Working closely with the coordinator (Dr. Kristin Winet) of CIRTL@UArizona, I have developed a one-year training plan that has been formalized as an official program for this academic year. With Dr. Winet, I recruited and am facilitating the participation of a new cohort of nine postdocs through this program and am leading a learning community for the cohort in the spring. This program has been shared at the CIRTL Network biannual meeting to be adapted at other schools.

Active and Problem-Based Learning:

Based on the literature (Armbruster et al., 2009; Freeman et al., 2014; Wood, 2009) and from my own experience as a TA, a co-teacher, and a student, my teaching philosophy focuses on active learning, formative assessment, and application-based projects. Additionally, as writing, interpersonal communication, and teamwork are important for development and valued by employers (Richter et al., 2018), I incorporate team

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activities and different opportunities for writing and communication skill development. I aim to include multiple methods of engaging with material and assessing understanding to provide flexibility and the greatest opportunity for student success.

- **Active Learning:** I will employ methods including peer instruction and clicker questions. Peer instruction relies on posing a question and asking for initial answers, then allowing for group discussions before a second poll is taken (Vickrey et al., 2015). Then students are asked to volunteer to defend their answers and finally the instructor can work through the points raised and help the class get to the right answer. This is a great way to engage large classes to identify learning pitfalls, to have students participate with each other and learn by communicating their thought process, and to keep students attentive during class. In an online setting, breakout rooms and polling can still be used in a synchronous course to achieve the same effect, or contributions through discussion boards and collaborative annotating in an asynchronous setting. In upper-level courses, group dissection of scientific figures can be adapted for similar purpose.
- **Formative Assessment:** Frequent, short, formative assessments encourage students to keep up with course material instead of “cramming” the night before a test, improving long-term retention (Offerdahl and Arneson, 2019). I would have students turn in a low-stakes short quiz, writing reflection, or other small assignment once a week to practice retrieval and improve retention (Lang, 2016). These can even be open-ended, bringing in problem-based learning of course concepts and encouraging students to connect concepts across different lessons. I am also very interested in incorporating peer and self-assessment in useful ways that teach students how to give feedback and be reflective, important skills for any career trajectory (Weimer, 2013).
- **Projects and Writing:** Because of the necessity of writing for many career paths, I will incorporate appropriate exercises to improve on this skill both for technical and non-technical audiences. My ideal goal for an upper-level course would be to have students work on semester-long projects that include synthesizing different written outputs based on the concepts they are learning over the semester applied to an individual topic. One example is a technical literature review or mock grant proposal that would have small check-ins or turn-ins over the course of the semester and could then be translated to science communication pieces including short presentation components.

Teaching Interests at UNC-Charlotte:

As mentioned above, I have experience in researching and teaching a diverse set of topics allowing me to adapt to the needs of the Department of Biological Sciences. I enjoy teaching classes of all sizes ranging from introductory to graduate-level. I could see contributing to currently offered courses such as Fundamentals of Microbiology (BIOL 2259), Bacterial Genetics (BIOL 4255/5255), or others as needed by the department.

Working largely in agriculturally and ecologically relevant systems, I can bring unique examples to the courses I teach, exposing students to the broad diversity of biological systems for which core topics and techniques can be applied. I welcome the opportunity to develop new elective courses on topics such as plant-microbe biology, symbioses, or microbiomes. I would be thrilled to connect with students about what course gaps they see are missing that I can fill in. A driver in my search for a position at a doctorate-granting institution is because of my demonstrated passion for graduate education and training. As such, I am excited to work with graduate students as teaching assistants and with postdocs for guest lectures or modules.

Strategies for Inclusion and Equity through Teaching:

Through my engagement with the issues of diverse students as an advocate, peer, and teacher, I have learned about the invisible difficulties faced by many in academia, even when I have not personally experienced them. These include lack of captioning or other disability accommodations, microaggressions and harassment based on gender, sexuality, or race, and the unspoken requirement for knowledge about the system (hidden curriculum). I seek out strategies to make courses accessible and inclusive through syllabus design and flexible technology-use policies. I recently completed an online course on Inclusive Teaching that empowered me with more ways to create an inclusive classroom and reminded me of the many ways that minoritized students can be disproportionately affected by events and the environment within and outside of the classroom. Instead of ignoring current events, I will approach my students with compassion to avoid alienating students with relevant social identities. Within my courses, I love highlighting the discoveries of diverse scientists, both contemporary and historical, to inspire students from all backgrounds. I employ strategies to learn student names, pronunciations, and pronouns quickly. I will continue to think critically about how my attendance and textbook requirements, submission deadlines, and other policies may adversely impact low income students and those

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with families, who are disproportionately students of color and/or women (Carnevale and Smith, 2018); **I strive to implement policies that encourage success while not punishing the realities of many students' situations.** In each of my classes, I promote resources that are available on campus to students in need without requiring them to identify those needs to me (mental health, food assistance, etc.) and I include information that cuts through the hidden curriculum of higher education.

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