Teaching Philosophy Summary

As a teacher, my first concern is creating conditions that encourage students to reach their full potential, both in and out of the classroom. The courses I teach are in the biological sciences, which are notorious for the amount of new terminology presented each semester. I challenge students to go beyond memorizing facts and vocabulary to asking how biologists study the living world. In each of these classes, and want my students to become enthusiastic scholars with an active interest in the biological sciences.

I believe role of the teacher in a classroom is to serve as an example of a professional scholar. This means staying current in microbiology, immunology and general biology. Part of this scholarship is adding to the tools available to other students and instructors by writing instructor’s manuals for textbooks, student study guides and textbooks. The second part of being a teaching scholar is implementing proven teaching techniques and testing new methods to determine if they increase engagement, learning and higher order thinking skills. This requires a willingness to try new things as well as planning and organizational skills needed to assess student learning so valid comparisons can be made. The ideal teacher is knowledgeable, current in his or her field of study, enthusiastic, respectful and cares about students as both fellow human beings and fellow scholars. Most of all, the ideal teacher takes the long view and asks the basic question: “How can their experiences in this course and at this university foster the professional development of students?” In a perfect world, graduates are critically thinking, responsible, scholarly members of society.

Courses Taught

**General Biology I** (Organismal Biology, Evolution, Intro Genetics, Ecology), **General Microbiology** (Majors – Cell Biology, Genetics, Ecology, Metabolism, Host-Pathogen Interactions), **General Genetics** (Transmission, Molecular, Population Genetics), **One Health: Predicting the next Pandemic** (One Health Principles and Science Literacy), **SEA-PHAGES** – (Phage discovery and annotation CURE courses)

Experience with Evidence-Based Teaching.

I am a graduate of the Biology Scholars program with over 20 years’ experience in the classroom. This includes being the assessment coordinator for the microbiology undergraduate program and publishing both curriculum and research papers in a variety of DBER journals, presenting at both SABER and ASMCUE national meetings, and winning multiple teaching awards for evidence-based teaching.

A. DBER Presentations and Publications (2015-present)


- **Nancy Boury** Using Game-Design Strategies to Develop Higher Order Skills with Vocabulary: Microbiology Code Names (2018) Presented at ASMCUE, 2018

Nancy Boury and Samantha Parks (2017) Finding Funds: Identifying Local Opportunities and Networking to Secure Support for Educational Activities and SOTL Research. Presented at ASMCUE ~50 participants


**B. Grants & Awards received (2015-present)**

- ASM Concept Inventory Conference - NSF-DUE #1625772 (awarded Spring 2016)
- “Tools for Assessment in Genetics (TAG)” NSF-DUE #1710262 $182,812 (awarded July 2017)
- “Evaluating the success of RCR training: development, validation, and application of an assessment tool” NSF-CCE STEM $523,413 NSF-SES# 1736990 (Awarded August 2017)
- Miller Faculty Fellowship," Save Us: Online general microbiology students as post-apocalyptic plague survivors" (Awarded 2017)
- College of Agriculture and Life Sciences Online Teaching award (Spring 2020)
- Iowa State University Innovative Teaching Award (Spring 2020)

**Educational Innovations Employed**

I have adopted both Universal Design for learning and Backwards design practices in all of my courses. This means the learning objectives are determined prior to the assessment plan. Once both learning objectives and the assessment plan are established, I design the learning activities for any course. Innovative classroom activities include: 1) Game based Learning : Microbiology "Code Names", Narrative-based General Microbiology 2) Flipped classroom : Interactive lecture videos assigned prior to in-class discussion of case studies and/or vocabulary practice 3) Developing a digital internship for Summer 2020 where students annotated a scientific podcast (TWiM), 4) Wikipedia Training for first year Honors students updating ~3 articles per term (Fall 2020 = radiotrophic fungus, respiratory pigments, Chinese rice fish)

**Discipline-Based Education Research Focus**

My research program at Iowa State University is split between developing teaching innovations (e.g. Digital internships, Game Based Learning, use of primary literature) and biology education research (e.g. Concept Inventory development). I serve as a reviewer for several microbiology and education research journals (e.g. JMBE, JCST, Frontiers in Microbiology) to keep current in both disciplines and the expectations of journals when submitting articles and to serve the professional community.

**Experience in Mentoring Others in Teaching**

- Steering Committee Member, The Ethics Network for Course-based Opportunities in Undergraduate Research (ENCOUR) (2019-present) Mentor a group of 20 fellows in general, and a small-group of 2 fellows specifically.
- Co-Chair American Society for Microbiology Conference of Undergraduate Educators (ASMCUE). 2019 (Chair, 2020)
- Preparing future faculty mentor (2017-present). Worked with graduate students to prepare lessons, teaching philosophy statements, and an entire course as part of a graduate certificate.