Teaching Interests and Vision by Gerald R. Urquhart

Three principles guide my teaching: 1) our goal is to prepare students to apply knowledge and critical thinking to solve novel problems, 2) active, inquiry-based and experiential learning are three fundamental methods to achieve this goal, and 3) access to a quality education should be as inclusive as possible, not limited to students simply because of background or financial resources.

I have a deep personal commitment to teaching at Michigan State University because it is a public institution with a strong commitment to undergraduate learning. Through programs like Lyman Briggs College (LBC) and the Department of Fisheries and Wildlife, MSU provides students with a high quality education that is accessible to most. In my time teaching at MSU, I have emphasized inclusion and diversity as central objectives and have focused not only on course-based solutions but also on wider curricular goals such as MSU’s Liberal Learning Goals, Creating Inclusive Excellence, and the Internationalizing the Student Experience initiative.

Teaching Interests

I am motivated in teaching by the desire to share my love of biology with students, and also to help students make connections between science and society, between natural systems and human systems. My course interests lie in teaching students the fundamentals of biology (LB 144 Introduction to Organismal Biology), helping students with weak preparation succeed in science (LB 155 Introduction to Quantitative Science and Research), introducing students to field biology (study abroad programs, field trips), sharing advanced subject knowledge in restoration ecology (FW 443) and tropical biology (ZOL/PLB 485), and finally examining connections between science and society in a capstone experience (LB 492 Senior Seminar). I would like to expand my time spent in the field with students, either through FW 101L Fundamentals of Fisheries and Wildlife Lab or FW 238 Field Methods in Fisheries and Wildlife.

Teaching Vision

The 21st century professor must employ a variety of teaching methods to be effective. In the classroom I utilize a wide array of techniques to engage students, including active learning, cooperative learning, case studies, and interactive technologies. An 80-minute lecture session typically consists of cycles of dynamic lecturing, student group work, and student feedback (clickers). As much as possible, I utilize “current topics” as the foundation for lectures, such as oil spills, MRSA, and HIV/AIDS.

In the laboratory, I have adopted the inquiry-based “Teams and Streams” approach pioneered in LBC by Doug Luckie and Jim Smith. Teams and Streams utilizes multi-week investigations centered around a theme (ecology, genetics, comparative biology) rather than week-to-week changes in lab topics. These investigations culminate in practical scientific products (scientific paper, poster, PowerPoint presentation), teaching students the process of exploring biology from start to finish.

Experiential learning is fundamental to preparing students to face challenges of real-world problems. During my years at MSU, I have developed several field experiences for students, including two study abroad programs in Panama and Nicaragua. A key element of the on-campus courses I teach, including introductory biology, is offering field trips for students wishing to get into the field. This interest draws me to courses like FW 101L that emphasize field experience and developing the naturalist in students. Leadership of study abroad has
provided me the best opportunity to get students into the field for long term immersion, and study away courses like FW 238 would also provide such an opportunity.

Diversity and inclusion are key goals in my educational vision. I am strongly committed to teaching a diverse group of students and providing the best opportunity for student success. In LBC, I lead an effort to improve the retention of underrepresented students, collaborating with Maxine Davis, Jonelle Golding, Cori Fata-Hartley, Kendra Cheruvelil, and Cheryl Murphy. I obtained funding from the Office of Inclusion and Intercultural Initiatives to develop course and curricular solutions (co-PIs Maxine Davis and Jonelle Golding).

Notable Teaching Activities

Course and curricular innovations to improve success of low math students: Starting in 2008, I identified key factors in the high failure and attrition rates for students with low incoming math scores and assembled a team of professors and advisors to address the problems. We developed coursework and curricular changes to attempt to reduce the barriers. Because many students in the low math group are underrepresented minorities, this program has improved the retention of a diverse student population in LBC. Although it is too early to determine the impact on graduation rates, elements of the program like LB 155 Introduction to Quantitative Science and Research have created a positive cohort experience for students who would have previously felt isolated in Lyman Briggs.

Study Abroad in Panama and Nicaragua: I developed two of the first study abroad programs offered through LBC and helped to make the College a campus leader in study abroad. Tropical Biodiversity and Conservation in Panama is a three week program with a strong scientific component including field research and natural history in a wide variety of ecosystems. Rainforests and Reality in Nicaragua is a one week program taught over spring break that provides an intensive exposure to many of Nicaragua’s ecosystems and cultures.

The impact of experiential learning on students is undeniable. Study abroad programs that include “real science” are an excellent way to give students the real world experiences they need to develop as future scientists. The Panama program focused on short term research experience (field problems) that allow students to experience the cycle from observation to hypothesis to experiment to analysis to conclusions in repeated cycles during the program. Students fill different roles as field problem leaders, data recorders/analysts, presentation leaders, or report authors, and through these experiences learn how to do scientific field research. This hands-on, authentic scientific experience has been greatly beneficial to students, evidenced in their testimonies about the program.

Interdisciplinary courses: I have team taught several courses focused on the intersection of science and society. In 2005, I co-taught a senior seminar on globalization and science with Michael Schechter from James Madison College. More recently, I taught FW/MC/LB 181, the Introduction to Science, Technology and Public Policy, with Tobin Craig. The coursework in the study abroad programs I developed is also interdisciplinary, and each year I have co-taught with other professors.

Mentoring Graduate Students: I have recently begun working with graduate students in the Department of Fisheries and Wildlife and find great reward in developing a positive mentoring relationship. My first graduate student, JP Lawrence, will complete his master’s thesis this semester. Two other students whose committees I co-lead are making excellent progress toward their Ph.Ds. I am very excited about the opportunity to mentor graduate students and serve as both an advisor and a role model in their professional and intellectual development.