

# **Teaching/Undergraduate and Graduate Education Symposium: Teaching graduate students to teach and be successful at teaching**

## **638 Engaging introductory animal science students through free-range learning.** Frank E. Robinson\*, Dana C. Penrice, and Martin J. Zuidhof, *University of Alberta, Edmonton, Alberta, Canada.*

Student success in post-secondary education is largely assessed by their competency assessed by exams and written reports. Curricula may be updated frequently or not. In some cases students are active learners, while in others, a lecture lab format leaves the students learning what they are told to. Often, first year students take primarily large basic science or arts classes with little direct connection to agriculture. An animal science course could serve to “warm-up” the first year for agriculture students. For 11 years, the introductory animal science class at the University of Alberta has carried about 50% of the marks though open-ended project work, known to us as “free-range learning.” Through a series of individual and group projects, over 1,100 students have learned the basics of animal science. Lectures, lab tours and exams are still held. The value-added part of the courses have been the offering of 2 to 4 projects per term, designed to allow creativity, embrace the arts, allow opportunity for in depth science discovery and to construct and maintain a learning community. In these projects, students become the experts, with encouragement to contact local individuals as well as those at other universities for up-to-date information. Student deliverables have included videos, live drama presentations, and in-class presentations. For some students, success in this environment can be a challenge so we have senior undergrad alumni return as “learning coaches.” Some projects have focused on tools and technologies used in animal production and processing and value-added food production. The program “There’s a Heifer in Your Tank” provided groups of students opportunity to answer “questions you didn’t know you had about food production” in a public venue reminiscent of an agriculture-based show. In an effort to build ag-fluency, a Rural Café provided 78 students a chance to converse one-on-one with 18 farmers in a speed-dating format. In our experience, engaging students as active learners has improved student satisfaction and retention and resulted in a stronger student-institution bond.

**Key Words:** student engagement, undergraduate learning, teaching

## **639 Teaching graduate students to teach: An integrated approach.** Donald L. Gillian-Daniel\*, *University of Wisconsin-Madison, Madison, WI.*

A key leverage point for improving undergraduate education is preparing graduate students and post-doctoral researchers to teach effectively. In this session, I will present a model professional development program for future faculty. I'll discuss the conceptual basis behind the program and its effects on the local institution. The Center for the Integration of Research, Teaching and Learning Network (CIRTL) is a national association of research universities collaborating to change graduate education by training graduate students and post-docs to teach. Three core ideas form CIRTL's conceptual framework: Teaching-As-Research – using disciplinary research skills to address questions about student learning; Learning Communities – engaging participants in shared learning around effective teaching; and Learning through Diversity – viewing diversity as an asset that can enrich learning. The Delta Program in Research, Teaching and Learning (Delta) at the University of Wisconsin-Madison is CIRTL programming. It involves credit-based graduate courses, facilitated discussion groups, workshops, community events, a Teaching-As-Research Internship and a Certificate. Delta's

use of CIRTL's conceptual framework has affected the campus. For example, (1) curricular innovations are developed and evaluated through Teaching-As-Research projects, which also promote cross-institutional collaborations (Gillian-Daniel and Walz, 2015). This type of capstone program has common elements that can be replicated at different institutions (Gillian-Daniel et al., 2015; submitted); (2) grant proposals that leverage Delta programming for broader impacts receive more research funding; (3) interdisciplinary STEM learning communities develop and thrive; (4) program graduates experience improved hiring and early-career success. CIRTL future faculty learn to apply research-based, high-impact teaching practices and to acquire data about student learning to advance their teaching (Pfund et al., 2012; Benbow et al., 2011). CIRTL's conceptual framework provides a solid foundation for training graduate students and post-docs how to teach effectively to promote learning.

**Key Words:** graduate education, teaching

## **640 Assessing teaching skills when hiring new faculty members, and rewarding faculty and graduate students for teaching well.** Kenneth G. Odde\*, *Kansas State University, Manhattan, KS.*

Outstanding teaching has long been a priority for animal science departments. Sustaining excellence in teaching has become a challenge for animal science departments because of declining state funding, the changing nature of our student bodies, loss of livestock units that support teaching, and increased emphasis on extramurally funded research. Excellence in teaching requires that the organization has a culture that respects teaching equal to other mission areas. Attributes of outstanding teachers include compassion for students, a commitment to helping students learn and grow, excellent listening and communication skills, and competence in the subject matter. When recruiting new faculty with teaching responsibilities, it is essential that the evaluation process include the potential for effective teaching. Most candidates for new faculty positions do not have extensive teaching training or experience. Therefore, the evaluation of teaching is primarily one of assessing teaching potential. Many departments use a teaching demonstration as part of the interview for faculty positions that have teaching responsibilities. Properly rewarding faculty and graduate students for excellence in teaching requires a reward system where teaching is effectively evaluated and respected. Student evaluation of teaching is a useful tool, but it has limitations. Peer evaluation of teaching can also be an effective tool in improving teaching quality.

**Key Words:** assessing teaching potential, rewarding teaching

## **641 Scholarship of teaching: What are the best methods of conducting research in teaching?** Michel A. Wattiaux\*, *University of Wisconsin, Madison, WI.*

Instructors are encouraged to bring some level of scholarship of teaching and learning (SoTL) to their instructional activities. Although years of experience may serve as a basis for scholarship, the informal or formal but purposeful collection of data, which is core to SoTL, provides a way to document efforts to improve teaching quality (which may contribute to reward system). However, the ultimate goal of research in teaching is student learning (i.e., achievements). Classroom assessment techniques

(CAT) are informal and formative tools providing instructors with an opportunity to modify instruction based on students' feedback (i.e., perception) when it matters the most (within a semester). Research has shown, however, that people are poor at evaluating their own learning. In contrast, a systematic data collection protocol can be deployed to generate replicated data addressing specific issues with the goal of producing generalizable knowledge. Unfortunately measuring learning outcomes is extremely complex demanding high level of expertise and investment in educational research. Reviewing a large body of literature, Carl Weiman (Nobel laureate in physics) and a colleague have proposed recently a simple teaching practice inventory tool, which they claim can be used as a proxy for students learning outcomes (measured as improvement in grades). This tool may serve as a pedagogical framework to initiate research projects. Evidently, innumerable factors influence the type of research an instructor can realistically engage in successfully. The literature abounds with examples of qualitative (words as data) or quantitative (numbers as data) approaches, experimental designs (pre- and posttest, survey) and statistical methods (parametric, non-parametric). Regardless of challenges and limitations inherent to research in teaching, it is essentially a goal-oriented discovery process that has the potential to transform profoundly one's own teaching practice. Thus, the "best" research methods might be the ones that the instructor deems most adequate to shed light on the degree to which the learning environment of their classes promotes student achievements.

**Key Words:** undergraduate education

**642 Is *Natural Sciences Education* the journal for you? Ken Barbarick\*, Colorado State University, Fort Collins, CO.**

*Natural Sciences Education* (NSE) is a peer-reviewed international journal published online continuously during the year. Articles are written by and for educators in the areas of animal science, ecology, natural resources, agronomy, the environment, entomology, and more. Articles cover extension, university, industry, administration, and grades K-12 education. NSE is published by the American Society of Agronomy. NSE provides quick turnaround (49 d from submission to first decision in 2014) and an editorial board that represents all cooperating societies and that works closely with authors to improve the chances for publication (76% acceptance rate on 29 submissions in 2014). We welcome pedagogical studies that include supporting data replicated in time or space, review papers, philosophical discussions, K-12 activities, and profiles of legendary scientists/teachers. We hope members of ADSA and ASAS will consider NSE as their outlet for educational papers.

**Key Words:** teaching