

Iowa State University has been successful in educating students on stakeholder-guided course outcomes.

Key Words: beef, curriculum revision, survey

TEACHING UNDERGRADUATE AND GRADUATE EDUCATION SYMPOSIUM: ANIMAL SCIENCE EDUCATION IN THE CURRENT ENVIRONMENT

1762 Introduction to learning theories and implications for classroom design. M. Clement*, *Berry College, Mount Berry, GA.*

Today's students may be underprepared for both graduate and undergraduate coursework, yet they seek to become professionals in their fields. Frustration on the part of all who teach in higher education has led to the question, "How do we teach today's students such that they master the content?" The answers to this question come from three areas: looking at traditional course design, backward by design, and transparent teaching. Additionally, the steps of lesson design and engagement techniques are important. Traditionally, professors planned a course by choosing a classic text, planning lectures, and hoping for the best. Traditional teaching can work, when the lessons are planned with visuals, informal assessments, and explicit teaching. Backward by design, also called understanding by design (Grant Wiggins and Jay McTighe's work), implies that an instructor look at the biggest, most important outcomes of a course, and then plan ways to get students to achieve those outcomes. Transparent teaching, as defined by Mary-Ann Winklemes, includes task, purpose, and criteria. Explicit explanations, crystal-clear aligned assessments, and a rationale of what is taught can improve student achievement. When much content must be mastered by students in order for them to progress to graduate school, or to begin their professional lives, explicit direct instruction can be powerful. Well-crafted, well-taught lessons achieve that end. Strategies for a single lesson include a focus, presentation of material, application/practice of material, and review/assessment. The knowledge base of learning continues to expand rapidly, and research-based methods of teaching do exist. The work of Brown, Roediger, and McDaniel has challenged traditional thought on how students learn, and influenced how professors can teach such that today's students can learn. All of these strategies can be used at all levels of teaching in animal science, to prepare the next generation of professionals in the field.

Key Words: college students, learning theory, teaching strategy

1763 Beyond veterinary school: Helping animal science students explore other career opportunities.

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A large percentage of students entering undergraduate animal science programs have a desire to become a veterinarian. For example, at Berry College, a private school in northwest Georgia with an animal science program, $81 \pm 0.6\%$ of the incoming freshmen ($n = 194$) for the last 2 yr have indicated a desire to become a veterinarian. Animal science is an appropriate undergraduate major for students interested in veterinary science, and animal science programs should help those students to successfully obtain those goals, however many students come from a background with little experience or knowledge of opportunities for a career working with animals other than veterinary medicine. At Berry College, $69 \pm 1.5\%$ of the incoming freshmen for the last 2 yr reported coming from an urban or suburban area, and only $14 \pm 1.9\%$ reported living on a farm. While more freshmen report being from a farm at Iowa State University (29.15% in 2014 and 42% in 2015), the trend is still similar. These urban and non-farm students have a desire to work with animals, but limited knowledge of the opportunities available as indicated by the fact that $25 \pm 2.9\%$ of the incoming freshmen at Berry College indicated having no experience working with their primary animal of interest. To help students further define where their passion may lie, steps have been implemented in the Department of Animal Science at Iowa State University to inform incoming and freshmen students about the diversity of careers in animal science. During campus visits with high school students and families, the vast array of opportunities surrounding careers in Animal Science are discussed briefly. More discussion follows during Freshmen Orientation, and also during ANS 110: Orientation in Animal Science. Freshmen and transfer students enrolled in ANS 110 were asked to indicate their interest in various careers at the beginning and again at the end of the semester. At the beginning of the semester, 62% (315 responding) indicated that veterinary school was their primary interest. The last week of class, only 43% (296 responding) responded that this was still at the top of their interests. Even more interesting was the increased interest in graduate school (8% in September vs. 17% in November). Identifying interests earlier in their collegiate career will allow students to take advantage of internships and other experiences more closely related to their interest.

Key Words: prevet, teaching, undergraduate

1764 A different approach in pedagogical model: Flipped classrooms. M. G. Maquivar¹ and A. Ahmadzadeh², ¹*Department of Animal Sciences, Washington State University, Pullman,* ²*University of Idaho, Moscow.*

New data indicate that undergraduate students are currently different from those 15 yr ago, their needs are different and they are more immersed in technological tools. As technology advances educators should learn more how to use these resources and pedagogical methodologies to enhance and promote active learning. Flipped classroom is a new pedagogical method developed to use different resources to create an environment where students take responsibility for their own learning. The end goal of this approach is to personalize learning and promote a more solid learning meeting the educational expectations of the new generation of undergraduate students. The concept of blended learning within flipped classrooms involves student participation through online or outside-classroom delivery of content and instruction that allows students to have some control over their time, effort, location and pace of delivery while using the traditional method of face-to-face classroom participation. The role of instructors in the classroom changes with the flipped classroom methodology, the faculty member is no longer the sole source of knowledge and information, instead, the instructor is a facilitator for students that allows students to take responsibility for much of their learning and knowledge attainment. The flipped classroom allows increasing interaction and personalized content time between students and faculty, promotes critical thinking, increase constructivist learning, engaged students in the course, and provides incentives students to prepare for class. The adoption of this pedagogical approach is slow and the courses have to be well designed and carefully planned to avoid student frustration and dissatisfaction with the course, however, there is no doubt that flipped classroom and/or blended learning approaches addresses students learning needs.

Key Words: flipped classroom, personalized learning

1765 Teaching evaluations and other alternatives to assess good teaching and learning. K. G. Odde*, *Kansas State University, Manhattan.*

Animal Science departments have long strived for excellence in teaching. Quality teaching programs have been difficult to maintain because of reduced state funding, changing demographics of students, loss of livestock units that support teaching, and greater emphasis on extramurally funded research. Building and sustaining a culture whereby teaching receives respect similar to other mission areas is critical. Trends in higher education are toward “the research institution”, since research is thought to drive more funding into the institution. However, the rapid increases in tuition rates in most institutions has made attracting students a high priority. Critical to building outstanding teaching programs is properly assessing teaching quality. The literature results on student evaluation of teaching as a tool for effectively evaluating and improving teaching are mixed. Some studies indicate that student evaluations can be useful and that results are positively correlated with learning, while others raise concerns about gender bias in student evaluations. Student evaluation of teaching is a useful tool, but has limitations. Peer evaluation of teaching can also be an effective tool in improving teaching quality.

Key Words: assessing teaching and learning, teaching evaluations

TOXIC PLANTS SYMPOSIUM

1766 Is there a difference between exposures to one or two plant toxins? K. D. Welch*, *USDA, ARS, Poisonous Plant Research Laboratory, Logan, UT.*

The majority of the plants in a given rangeland provide valuable forage for livestock species. However, plants that can poison livestock are very much a part of our rangelands. In this regard, most rangelands contain more than one poisonous plant. Frequently, much is known regarding the toxicity of individual plants and their effects on livestock. However, little is known regarding the effect of co-exposure to multiple toxic plants or even the effect of multiple toxins from an individual plant. Mixture toxicology, or the study of the co-exposure to multiple toxins, can result in additive, synergistic, or antagonistic effects. This presentation will highlight some of the recent research from the Poisonous Plant Research Lab wherein the effect of co-administering multiple plant toxins from the same plant and the effect of co-administration of different poisonous plants has been evaluated. A better understanding of the effect of co-exposure to multiple poisonous plants, and the mixture toxicology involved, will be useful in developing more beneficial management recommendations