

Modifications to an Introductory Animal Science Course to Meet the Demands of Covid-19 Restrictions Improved Student Engagement

Introduction

At Murray State University (MSU), Animal Science (AGR 100) is a 3-hour introductory course designed to give students an overview of production agriculture. It has both face-to-face and web-based sections each semester, including summers. Material covered includes production overviews for poultry, swine, beef, dairy, small ruminant, and equine systems, as well as introductions to meat science, growth and development, nutrition, reproduction, and genetics.

The course is required for all agriculture majors, with approximately 250 students taking the course each year. The intent is for students to take this during their freshman year, and class size is limited to 50 per section. This course also serves as a prerequisite for several more advanced animal production and management courses.

Prior to 2020, the course met two days a week for 75 minutes per class session and was strictly lecture-based. Faculty observations and student feedback indicated that adding laboratory activities could potentially improve student engagement and retention of basic material. Upon hiring a new faculty member in Fall 2019, discussions on course revisions to improve student engagement began. However, no changes had been implemented when COVID-19 resulted in all classes being moved to an online format.

Procedure: How things changed during the pandemic

During Spring 2020, when COVID-19 restrictions were implemented, we moved the second half of the semester into an online format. Lectures were pre-recorded and posted into the learning management system for students to view. We observed that students more frequently skipped submitting assignments and did more poorly on exams and quizzes. This reinforced the intention to make changes to the course when face-to-face classes resumed.

When courses resumed in the Fall 2020 semester for a shortened term (from 16 to 13 weeks), social distancing restrictions were imposed. This limited our classroom capacity to 25 people. Changes were made to the format of the course to include activities outside the classroom. As we adapted, our goal was to continue teaching as much of the course face-to-face as possible, minimize hybrid/online class time, and improve student engagement with various activities at the University farms.

We maintained enrollment at 50 students per section but split each section into two subsections. In addition to the primary instructor, two additional faculty members were assigned to assist with the course. We added a farm or laboratory-based experience for each week. On each class day, half the

students met with the primary instructor in the classroom for more traditional lectures, while the other half met with one of the alternate instructors on one of the MSU farms or laboratories. On the second day of the week, the students would swap locations. Alternate class locations included the swine, beef, and equine units, and visits or speakers coincided with the modules for those species. For other species, we brought in guest speakers and animals to complete the picture. We also put together discipline-specific labs either on the farm or in a separate laboratory space around topics like meat science, nutrition, and reproduction. To meet the minimum contact hours within the shortened semester, we added a weekly online discussion focusing on current events and research.

Accommodating the experiential opportunities required all departmental faculty and staff to be engaged in this introductory course. Each lecture, lab, or experiential opportunity had to be repeated eight times each week, four times each Tuesday and Thursday. This required a high degree of coordination and organization. In the first year using this new format, three faculty members were assigned to the course: a primary instructor who oversaw the entire course and two additional faculty who coordinated and managed the lab or experiential opportunity. This was not a viable long-term option for the course, but it was sufficient during COVID-19 to improve the course.

Based on informal conversations during and outside of class, students expressed enjoyment of the class format, particularly when compared to either a traditional lecture-only setting or the hybrid settings they were experiencing in other courses at the time. The faculty and staff also had a higher level of engagement in general with the student body, resulting in more student interest in advanced animal science classes. Course evaluations indicated that the lab experiences were highly impactful to student learning, with 54% of open comments specifically commenting on the laboratory aspect of the class. Scores for median evaluation, course engagement, and several specific formative items improved from 2019 to 2020 (Table 1). However, despite positive student feedback, overall course grades were not different in Fall 2020 as compared to Fall 2019 (81% and 82%, respectively). Review of specific assignments showed that the inclusion of online discussions was an unfavorable addition to the Fall 2020 course. Lack of student participation likely resulted in slightly lower grades in the course overall.

Parameter	Fall 2019	Fall 2020
Response rate	n=91/169, 53.8%	n=72/149, 48.3
Median course evaluation ²	3.4	4.0
Course engagement score ³	4.7	5.2
Relevance and usefulness of course content ⁴	3.6	4.4
Use of class time ⁴	3.6	4.2

¹/ASystem™, University of Washington, Seattle.

²Median course evaluation represents the combined responses of students to the evaluation's global summative items and provides an overall index of the class's quality. 0 = lowest; 5 = highest.

³Course engagement score combines student responses to several evaluation items relating to how academically challenging students found the course to be and how engaged they were. 1 = lowest; 7 = highest.

⁴0 = Very Poor; 1 = Poor; 2 = Fair; 3 = Good; 4 = Very Good; 5 = Excellent.

Assessment: Our new normal

Based on student and faculty feedback, we decided to keep many of the weekly field experiences in the class when distancing requirements were relaxed the following semester. The content of field experiences changes as new opportunities arise. As of 2022, we have unsplit sections of 50 students who engaged in weekly farm/lab experiences. We have reduced direct faculty involvement to one primary instructor and one support instructor. This format continues to present challenges in managing these experiences. Course evaluations have continued to highlight the strong student affinity for these parts of the course.

Finally, when evaluating the retention of freshmen from their first to second fall semesters (Fall 2019 to Fall 2020), the Animal/Equine Science department maintained a higher retention rate as compared to the University overall (62.5% versus 55.3%, respectively). We believe some of this retention is based on the students' experiences in courses like AGR 100, and we intend to continue to develop experiential-based activities in other classes to encourage student engagement.

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