

Collaborative Teaching Meat-Animal Growth, Development, and Evaluation at a Distance

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Abstract

An animal growth and development course was taught as a collaborative effort by thirteen faculty members at five universities using distance learning technologies to coordinate and concentrate expertise. Live synchronous presentations and interactions were conducted via nine, 2-hour satellite sessions and eleven, 2-hour audioteleconference sessions. Asynchronous support was provided via videos and print materials, and an all-class "subscriber" listserv was available for students to raise questions or participate in discussions. Twenty-five project groups collaborated across institutions on topics of their choice via preconfigured listservs. A total of 182 students across 13 institutions enrolled; one site (36 students) withdrew due to inadequate prerequisites of its students. Students indicated a preference for satellite over audio-only sessions. They recommend more continuity among instructors, congruence between lectures and materials, greater clarity of key points and more production-oriented application of content. Collaborative teaching allowed students more exposure to some topics in more detail than traditional methods would have allowed. Faculty noted that the incorporation of technology challenged both teachers and learners. Results were used to modify the course for future semesters and to serve as a model for other courses taught at a distance.

Introduction

As budget constraints increase, the ability of life science and agricultural colleges to offer a full curriculum may be compromised. One solution to this problem is the creative and collaborative use of instructional technologies. Combining resources from several institutions allows development of courses that increase the breadth of offerings available to students. Consequently, the Committee on Institutional Cooperation (CIC) has encouraged collaboration among and beyond CIC institutions (CIC, 1999). A critical course for many students in animal agriculture is animal growth, development, and evaluation; however, few institutions have the faculty expertise to offer a course of such breadth. Further, at those institutions with adequate faculty resources, the scope of expertise may still be compromised. Combining the expertise of many

specialists permits development of a course that far exceeds the capabilities of any one faculty member. Using a variety of instructional technologies, other institutions not immediately involved in the development and delivery of the course can enroll students to take advantage of this new synergism. The objectives of this project were: 1) for five universities to design, develop and deliver an upper division undergraduate course in meat-animal growth, development, and evaluation to food and agricultural sciences-related colleges and universities; and 2) to use the course as a working model for others wishing to implement collaborative teaching and learning methods at a distance.

Methods

Thirteen animal science professors representing five land-grant universities (Purdue University, University of Illinois, Iowa State University, University of Missouri, and University of Wisconsin) designed a 3-credit animal growth, development and evaluation course for upper-class, undergraduate majors. After extensive planning, course details were finalized and advertised on the American Distance Education Consortium (ADEC) web site and in the *Journal of Animal Science*. Forty-five institutions were contacted and invited to participate. A total of 182 students across 13 institutions enrolled (Table 1), and packets of course syllabi, handouts, instructions and texts were distributed to each site coordinator. The course included twenty, 2-hour sessions from September to November, 1997. Nine sessions (sessions 1, 2, 4, 11, 12, 13, 18, 19, and 20) included satellite broadcasts and the remaining eleven were audio-only. Students, site coordinators, and instructors were connected to a master listserv e-mail network. Twenty-five teams composed of students across institutions were formed and were provided a choice of topics to research. Teams were asked to prepare an abstract and final written report. Special listservs were established for each team so students could communicate electronically. Team abstracts were posted to the master listserv for viewing by the entire class. Midterm and final examinations were prepared and distributed to site coordinators for administering and grading. The course and instructors were evaluated by students at all sites during the final session using a standard questionnaire form (scale of 1 to 8), but were only returned from eight sites. Site coordinators were responsible for course assistance,

Table 1. Final list of sites and number of students at each site.

Site Number and Coordinator	Number of Sites	Number of Students
1. Purdue University	1	60
2. Indiana Purdue University-Fort Wayne	1	2
3. University of Missouri-Columbia	1	2
4. University of Illinois-Urbana	1	5
5. University of Wisconsin-Madison	1	22
6. University of Wisconsin-Platteville	1	6
7. Iowa State University	13	15
8. University of Tennessee-Knoxville	1	18
9. University of Tennessee-Martin	1	3
10. Colorado State University	1	4
11. University of Minnesota-Crookston	1	4
12. ¹ Mankato State College	1	3
13. ² University of Alberta	1	2

¹Mankato State College was used as a videoteleconferencing facility for employees of a company.

²Lectures were not delivered to University of Alberta; students participated in special group project only.

discussion, proctoring examinations, grading and issuing credit.

Results and Discussion

One of the main challenges of this project was designing a course that would be demanded by multiple institutions. The Animal Growth, Development and Evaluation course at Purdue University (West Lafayette) was used as a model because instructors believed that this course would serve the needs of many students at institutions lacking a meat-animal growth course. The Purdue course is an upper-level undergraduate 4-credit hour course with lectures and laboratory sections. For this project, the lecture portion of the course was re-designed and presented as 20 individual, 2-hour sessions. Sessions were presented Tuesday and Thursday evenings. Time zones did not present any major difficulty; however, Indiana students were required to meet one hour later during the last half of the semester because the majority of Indiana does not adjust for daylight savings time. Students at Purdue University and University of Wisconsin-Madison were required to attend laboratory sections, but other sites did not require laboratory sections. Consequently, non-Purdue students received 3 credits for completing the course, whereas additional credits were awarded to students at Purdue (1 credit) and Madison (2 credits). Due to the unexpected amount of time required to

re-design the course, little time was allowed for recruiting additional sites. This lack of advanced notice discouraged 20 institutions from enrolling. One site (36 students) withdrew due to inadequate prerequisites of its students, possibly because we did not emphasize the level at which course material would be taught.

A second challenge of this project was the organization of lecture material. Ensuring continuity among lectures was difficult with 13 instructors. Many instructors did not view lectures presented by others and consequently did not inter-relate course material. The inability of the teachers to inter-relate sessions diminished the cohesive nature of the course material. This likely contributed to some of the lower scores from the course evaluation when students were asked if the course was logically organized (Table 2).

The use of thirteen instructors with different teaching and learning styles likely contributed to some of the difficulty of students to learn (Honeyman and Miller, 1998; Hoover and Marshall, 1998; Rudd et al., 1998). Students at some sites accepted the varying teaching methods to a greater extent than students at other sites (Table 2). Perhaps this reflects the background and past experience of students. Sites that scored teaching methods low also scored appropriate amount of work low (Table 2).

Although it is difficult to know how a student defines appropriate amount of work, one must assume that it is relative to the amount of work required by other courses. For many students, this was the first time they were required to use e-mail for a course (or at all). The additional time required for some students to learn how to use e-mail and to communicate effectively by e-mail may have led students to conclude that the course required too much time. Faculty learned to teach using a variety of media and were able in some instances to encourage free exchange of ideas during sessions (Table 2).

Difficulty in establishing adequate electronic communication affected class morale. Many students were not familiar with using e-mail to correspond with team members. Group projects in other courses often involve live discussions in which instant feedback is obtained. In the present course, students often complained to instructors that e-mail required too much time to obtain replies from team members. However, despite these challenges, all students were able to work in groups on-line and complete the group project assignment. Furthermore, use of e-mail facilitated interaction among learners and faculty members outside of class sessions (Table 2).

When a particular site (Iowa State University) was unable to coordinate a centralized site for downlinks, needs of individual learners were met by sending videotapes of sessions; however, taped sessions hindered course progress at one site. Some handouts were inadequate because course materials were distributed before the course began, and instructors were not able to complete the handouts so early in advance. Inadequate handouts interfered with maximum learning. Unfortunately, instructors did not use the web site for providing additional course materials during the semester.

Of all questions asked in the course evaluation, scores were highest for the question pertaining to delivery of up-to-date, state-of-the-art knowledge of animal growth processes (Table 2). Delivery at this level was accomplished by having multiple instructors who incorporated new research findings into sessions.

Based on the results described above, major modifications were made to the course before it was offered in subsequent years. In 1999, the course was offered live to Purdue University (West Lafayette), Indiana-Purdue University (Fort Wayne campus), and Western Illinois University (McComb). In addition to these three sites,

Table 2. Mean course evaluation scores based upon achievement of expected standards (1 = not met; 8 = fully met).

Expected Standard ^y	Site ^z								Mean	SD
	1	3	4	5	6	7	8	11		
The course was logically organized.	5.5	5.0	5.3	5.4	4.3	4.8	3.9	6.0	5.1	1.8
The instructors used appropriate teaching methods.	5.5	4.0	3.8	5.3	6.0	5.5	3.6	7.3	5.2	1.9
The course required an appropriate amount of work.	5.5	5.5	5.5	5.7	7.0	5.5	5.1	7.3	5.6	1.7
The instructors encouraged free exchange of ideas.	6.7	5.0	6.0	6.7	6.2	6.1	5.5	8.0	6.4	1.5
The instructors were available outside of class.	6.8	5.0	4.8	6.4	6.2	5.8	5.3	7.7	6.2	1.8
The instructors demonstrated thorough and up-to-date knowledge.	7.1	6.5	6.5	7.0	7.3	6.4	5.9	8.0	6.8	1.3

^yStudents scored the level at which expected standards were met (1 = not met; 8 = fully met).

^zSite numbers correspond to sites listed in Table 1.

videotapes of sessions were sent to Prairie View A&M (Texas) and University of Wisconsin-Madison. These latter two sites did not feel they could justify the added time and expense to offer the class live to their students. Major changes included: 1) The two-hour, bi-weekly sessions were re-formatted and offered as one-hour sessions three times per week. 2) All sessions were transmitted using two-way videoconferencing. 3) Integrated Services Digital Network (ISDN) lines were used rather than satellite to reduce costs. 4) The number of instructors was reduced to five in an attempt to improve continuity among sessions (three Purdue instructors, one Iowa State University instructor, and one University of Wisconsin instructor). 5) A web-site was developed with various course materials (O'Kane and Armstrong, 1997). The web site contained the class syllabus, assignments, study questions, and lecture handouts. The study questions were found to be a very valuable component of the team-taught course as also shown by Barnes et al. (1999).

This project has also been used as a model to teach a Purdue graduate-level course to students at Michigan State University in 2000. Plans are underway to offer additional courses among universities.

Summary

We have demonstrated that collaborative-taught courses involving faculty at multiple universities provide students with material not otherwise available in their curricula. We have described a working model that is serving to help develop other distance-education courses. Use of various instructional technologies challenges both students and instructors, but ultimately provides greater awareness (for faculty) of teaching and learning styles that are effective for teaching at a distance.

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Literature Cited

- Barnes, D.M., J.P. Sims, and W. Jamison. 1999. Use of internet-based resources to support an introductory animal and poultry science course. *J. Anim. Sci.* 77:1306-1313.
- CIC. 1999. Committee on Institutional Cooperation, <http://www.cic.net>.
- Honeyman, M.S. and G.S. Miller. 1998. The effect of teaching approaches on achievement and satisfaction of field-dependent and field-independent learners in animal science. *J. Anim. Sci.* 76:1710-1715.
- Hoover, T.S. and T.T. Marshall. 1998. A comparison of learning styles and demographic characteristics of students enrolled in selected animal science courses. *J. Anim. Sci.* 76:3169-3173.
- O'Kane, M. and J.D. Armstrong. 1997. Developing course materials using the world wide web. *NACTA J.* 41(2):10-15.
- Rudd, R., M. Baker, and T. Hoover. 1998. Student and faculty learning styles within academic units in the University of Florida's College of Agriculture. *NACTA J.* 42(3):18-24.

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