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Teaching an Animal Science Discovery Course to Freshman

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Abstract

An animal science discovery course designed to facilitate the transition of first year students to the university, introduce students to current technology and stimulate their curiosity and excitement about the field, and provide a more complete understanding of the career options available to them, was developed and taught. Animal Sciences 110. "Living with Animals and Biotechnology", successfully accomplished these goals. The 1 credit course was a discussion course covering issues within animal science and biotechnology. Students were also required to maintain a notebook of the discussions, find and give a presentation on an recently published article related to the subject matter, and take a comprehensive final examination. Students completing the course felt that the course was a valuable learning experience and the first-year learners enjoyed being involved in discussions with a faculty member. Offering 1 credit

discovery courses may be developed with information provided in this manuscript, does not greatly interfere with the teacher's duties in other courses or in conducting research, and the benefits will more than compensate for the time required to teach this course.

Introduction

During their freshman year students are exposed to a heavy load of required courses and get minimal personal attention, interaction with faculty, and exposure to career options (Donnermeyer and Kreps, 1994; Ellis, 1993). One way to overcome these deficiencies was to have students enroll in an animal science discovery course. Not only did students rate the course highly as a valuable learning experience, they also felt that the format of the course made learning more interesting.

In addition to facilitating their transition to the university, I found that the animal science discovery course improved the impression non-majors had of animal science.

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After completing the discovery course, 86% of non-majors indicated that they were now considering additional courses in animal science.

The purpose of this manuscript is to describe the format and benefits of an animal science discovery course with sufficient detail so that discovery courses could be offered by others.

The Course

The animal science discovery course is a one credit course offered only to students not majoring in animal science. Animal Science 110, entitled "Living with Animals and Biotechnology". was designed to provide freshman students with an overview of how animals and biotechnology interact with our global society. It focused on technological achievements of agriculture, medicine, and industry in our world and was designed as a discussion course that met once weekly for a 50-minute period. Enrollment was limited to 20 freshman students each semester.

The course has been taught 3 semesters. Although course format has varied, the best format was established the last semester the course was offered and will be used for future offerings. In addition to weekly discussions, each student made a 5 to 10 minute oral presentation on a recent publication on animals or on innovations in biotechnology. Students were responsible for identifying and locating the publication and were also required to maintain a notebook that included information in Table 1 for each of the weekly discussions. Grades were based equally upon the notebook, the oral presentation, and a comprehensive final examination that required the students to use their critical thinking skills. The comprehensive final examination was equally divided into take-home and in-class sections. Students were required to complete the notebook information (as outlined in Table 1) outside of class rather than taking notes in class. This allowed students to focus on the discussion rather than on note taking. Extra credit was given to students completing a .5 hour one-on-one meeting with the instructor.

Potential subjects for discussion are listed in Table 2. Topics that have been included are 1, 2, 4, 6, 7, 8, 9, 11, 12, 14, 16, 17, 19, 20, 21, 23, 24, 28, 31, 32, and 33 from Table 2. In addition to the discussions, it has been valuable to have 1 or 2 tours/hands-on laboratories. This involved taking the students into a research laboratory to see and participate in on-going research activities by departmental faculty. Tours/hands-on laboratories have included viewing a transgenic laboratory where students were allowed to micro-inject DNA into mouse embryos and conducting an enzyme-linked immunosorbent assay for the determination of pregnancy.

The week before a class, students were assigned readings. At the beginning of each class period, a short list

of questions or exercises were presented to the students which enhanced discussions. An example used for the first class is presented in Table 3.

The last class meeting involved a discussion of careers in life and animal sciences. Students were also requested to complete a course and instructor evaluation which has been used to improve the course over the 3 semesters.

Discussion

Fewer students with agricultural backgrounds are entering college today (Dalmaso, 1990). Students without agricultural backgrounds generally know very little about the agricultural disciplines and the careers in agricultural-based industries. Since animal science majors can not take the class; the majority (78%) of students were Liberal Arts and Sciences majors with an interest in animals. Most of these students have had little exposure to animal science. The following are comments from students enrolled the most recent semester (Spring 1996) which effectively summarize their thoughts about the course.

- He made me doubt my major-it was that neat!
- I learned about new technologies. This class was very interesting and made me want to take another Animal Science class.
- We talked about some very interesting topics that I didn't know about. It gave me some ideas about what I may want to work with.
- I was able to get a taste of agriculture and a look into animal science.
- I just want to take this chance to applaud you on this class. This style of teaching I enjoy. I learned quite a bit from your class. It is a pity that we as students cannot get as much out of some 3 and 4 credit courses. In my opinion this class is an excellent "thinking" class and I want to thank you for opening my sometimes closed mind. I hope to have interaction with you in the future.

The list of selected topics in Table 2 is not complete. There are more topics than can be covered in a one credit course. Rather than include more topics and increase credit, it may be prudent to have more one credit discovery courses offered with titles that would attract students so that more students could be reached. This would allow instructors to

Table 1. Material required to be maintained by each student for each of the weekly discussions.

Date: _____ Subject: _____

Was today's discussion valuable? _____ (Yes/No)

Were you previously aware of the issues associated with today's discussion topic?
_____ (Yes/No)

Should this discussion topic be used in future semesters?
_____ (Yes/No)

List at least three things learned from today's discussion.

What suggestions would you make to improve today's discussion and discussion topic?

Rate today's article presentation by _____

as Outstanding = 10 to Poor = 1. _____

Table 2. Subjects that may be covered in an animal science discovery course.

Subject

Section I:

1. Culture, Procedures, and Opportunities of the Campus
2. Careers in Life and Animal Sciences

Section II:

3. Origins of Mammals
4. Animal Contributions to Human Needs
5. Animal-Human Interactions
6. Domestic and Wild Animal Populations
7. The Effect of Animals on the Environment

Section III:

8. Do Livestock Compete with Humans for Food Resources?
9. Diet and the Quality of Animal Products
10. Obesity, Anorexia, and Innovations in Weight Control

Section IV:

11. Animal Welfare and Animal Rights
12. Animal Experimentation
13. New Animal Species: Research Models
14. Pharmaceuticals and Vaccines
15. FDA and Regulations on Drugs, Research, and Technology

Section V:

16. Tissue Transplantation
17. DNA Manipulation and Technology
18. Gene Mapping
19. Transgenic Animals

Section VI:

20. Anabolic Steroids
21. Diethylstilbestrol and In Utero Effects on Embryo Development
22. Infertility/Fertility Drugs
23. Bovine Somatotropin-bST

Section VII:

24. Ovulation Inhibition
25. Male Contraception
26. Sex Selection of Sperm
27. In Vitro Fertilization
28. Human Embryo Research and Embryo Manipulation
29. Abortion Drugs: Efficacy, Safety, and Other Issues

Section VIII:

30. Anti-aging Drugs
 31. Melatonin
 32. Silicone: Drug Delivery and Tissue Responses
 33. Monoclonal Antibodies
 34. Bovine Spongiform Encephalopathy
 35. Ebola Virus, HIV Virus, and Morbillivirus
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Table 3. An example of questions/exercises that can be used for each discussion period.

Date: _____ Name: _____

What is your major? _____

What do you wish to do after graduation? _____

How much exposure have you previously had with Animal Sciences as a discipline?

5 4 3 2 1

5= very knowledgeable

1= no knowledge

Rate the following 1 to 10 with 10 = risky to 1 = no risk.

_____ Meat from a Steroid-Treated Animal

_____ Underweight with Below-Normal Cholesterol Levels

_____ Genetically Engineered Vaccines

_____ Taking Diethylstilbestrol

_____ Asbestos

_____ Alcoholic Beverages

_____ Taking Anabolic Steroids

_____ Milk from Cows Treated with bST

_____ Taking Contraceptives

_____ Nuclear Power

_____ Taking Melatonin

_____ Driving a Car in a Wooded Area at Dusk

_____ Taking a Non-FDA approved Anti-aging Compound

_____ Eating Beef of United Kingdom Origin

focus a discovery course on their area of interest/expertise. I found that the quality of the discussion was greater the more I knew about the subject. Each of the sections II-VIII could be one credit discovery courses.

The environment of the course encouraged the students to become involved in the discussions. Others have described how involvement motivates students (Kauffman et al. 1971; Campbell, 1977). Another motivational factor incorporated into the course design was getting to know students (Campbell, 1977).

Instructors selected for this type of course should be faculty willing to befriend freshman students (Ellis, 1993) and that appreciate their [the students'] predicament. If the discovery course is in the general field of expertise of the faculty member teaching the course, offering a 1 credit discussion course does not greatly interfere with the faculty member's duties in other courses or in conducting research.

The information provided in this manuscript may assist in the development of one credit animal science discovery courses. Based on all feedback available, the animal science discovery course was valuable to the students' education and accomplished many objectives as described in the next section.

Accomplishments/Outcomes

- Facilitated the transition of students to the university.
- Introduced students to campus culture, procedures, and opportunities.
- Motivated students during their first year in college.
- Stimulated student curiosity and excitement about the field.
- Enhanced students' opinion of animal science.
- Encouraged students to take more courses in animal science.
- Established a mentoring relationship between faculty and students.
- Provided a more complete understanding of the career options available to them.
- Caused students to use and improve upon their public speaking skills.
- Encouraged students to use and further their critical thinking skills.

During their first year of college, students are unacquainted with the procedures and practices of college

life and culture. Freshman are experiencing, often for the first time in their life, a new environment and a significantly higher level of intellectual challenge. Far too often, students are in large classes where nobody takes the trouble to get to know them (Willimon and Naylor, 1995). In my experience, offering a small comfortable class in which students get to know a professor and be known as a person, rather than a number, facilitated their transition to the university and motivated them to excel since someone, outside their family, has taken a personal interest in them.

Instructors, then have the opportunity to stimulate student interest, curiosity, and excitement about the instructor's area of expertise, enhance the student's opinion of a field of study, and encourage students to take more courses in a field of study. During the three semesters that this course has been offered, the course has led to a mentoring relationship between faculty and students and in some cases has led to further study.

During their first year of college, students need to be introduced to contemporary issues, including environmental and technological issues, with a global dimension. Freshman not only need introduction to these topics but they need to be challenged intellectually, such as through small group discussions, so that they may critically, analytically, and creatively think about these issues, form an opinion based on scientific facts, and express their thoughts, orally and in written form, with conviction and persuasion as students. This has been done in Animal Sciences 110.

Providing a small, comfortable class in which the students are known as persons by a professor is, therefore, a simple way of enhancing the quality of the freshman year for students. Students may then be challenged to critically think about current issues and given the opportunity to enhance their communication skills.

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