

Using Topics in Animal Science as a Platform to Teach Bioethics to University Honors Program Students

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Summary and Implications

A seminar course was developed using topics in animal science as a platform for teaching bioethics to university honors program students. The seminar course was structured to provide students with an introduction to major ethical theories (e.g., ethical relativism, utilitarianism), followed by an overview of livestock assisted reproductive technologies such as artificial insemination, embryo transfer, in vitro fertilization, and nuclear transfer (“cloning”). The latter half of the course focused on student-developed presentations on a bioethical issue. Students from a wide variety of majors from several different colleges within Iowa State University successfully completed the course. This course serves as an excellent example of engaging students in meaningful dialogue on contemporary societal issues while concurrently developing critical thinking skills of students and teaching them about bioethics.

Introduction

The Iowa State University honors program was developed in 1960 (<http://www.honors.iastate.edu/HonorsWebPage/About/history.php>). The three-fold mission of the honors program is: 1) to provide an intellectually stimulating environment and an effective set of mechanisms for superior students to maximize the quality of their educational experience, by achieving a degree of breadth and depth not necessarily available in their regular curricula, 2) to provide a medium for interaction for faculty and students, through honors courses and seminars, undergraduate research experiences, and mentoring programs, and 3) to serve as a recruiting mechanism for attracting a diverse group of superior undergraduate students to the university. (see <http://www.honors.iastate.edu/HonorsWebPage/About/AboutHonors.php>)

Students are admitted into the university honors program either through a recruitment process targeting entering freshmen or via a student-initiated application process. Students may participate as a freshmen, associate, or full member of the university honors program.

To maintain membership in the university honors program, students must fulfill certain requirements. For example, associate or full honors program members are required to maintain a cumulative grade point average of 3.50 (on a 4.0 basis). In addition, students are required to

enroll in and successfully complete one honors program seminar course per academic school year.

Honors program seminar courses are designed to promote a crucial atmosphere of intellectual exchange and a high level of student involvement in learning (see <http://www.honors.iastate.edu/HonorsWebPage/current/seminars2.php>).

Seminar courses enable students to engage in limited-enrollment (15-student maximum) interactive courses dealing with topics outside of their normal curricula. These seminar courses typically have no prerequisites other than the student being a member of the university honors program, and the courses are offered solely on a pass-not pass grading basis.

Faculty from all disciplines across the university’s academic programs are invited to develop and submit (to the university honors program committee) proposals for honors program seminar courses. Seminar courses are selected to provide students with a wide variety of courses taught by a diverse set of faculty with the hopes of bringing together in a single seminar course honors program students from a broad range of majors.

In 1993, a proposal for a university honors program seminar course focusing on bioethics was submitted to and approved by the university honors program committee. The objective of this report is to provide an overview of the development and evolution of the honors program seminar course titled “Assisted Reproductive Technologies: Biological and Ethical Considerations”.

Materials and Methods

The Bioethics Program at Iowa State University (ISU) was launched in 1986 (Gary Comstock, personal communication), and one of the major activities of the bioethics program was conducting a week-long bioethics institute. The first ISU Bioethics Institute was held in 1991. Philosophers, ethicists, and other experts in related fields were brought together during each bioethics institute for the purpose of educating faculty in the life sciences (such as animal science, agronomy, zoology) in bioethics, with the goal of arming life sciences faculty members with sufficient background and knowledge of bioethics so they felt comfortable engaging in meaningful dialogue pertaining to bioethics with students as well as the public.

Participating in the bioethics institute stimulated the author to develop an honors program seminar course focusing on bioethics. Because the author is not a bioethicist, a decision was made to use the field in which the author had considerable experience (reproductive

biology) as a springboard for teaching students about bioethics.

One of the challenges in developing an honors program seminar course is structuring the course so that all students, irrespective of major, are able to actively engage in the course even if they possess little or no prior knowledge of the subject matter being taught. This challenge was kept in mind during development of “Assisted Reproductive Technologies: Biological and Ethical Considerations”.

The seminar course was structured in four parts. The first part of the course (the first day of class) consisted of an introduction to the course, as well as an exercise to allow students to become acquainted with one another. Students were asked to pair with another student in the course whom they did not know and then interview that student. Interviews were “guided” by requiring students to use a standardized form consisting of six questions: 1) What is your name? 2) What is your major? 3) Where were you born? 4) What is one reason you enrolled in this seminar course? 5) Where did you work or travel this past summer? and 6) Who was the most famous person you have ever met, and what did the famous person say to you? OR What is one change in society that you would strive to implement if you were President of the U.S.?

The second part of the course consisted of an introduction to ethics (including a discussion of how it may relate to religion, logic, and philosophy), as well as a discussion of the five major ethical theories (ethical relativism, divine command theories, utilitarianism, deontology, and virtue ethics). A write-pass exercise was incorporated to teach students about arguments (making a claim and providing a reason to support the claim) and assumptions that are often inherent in arguments. The write-pass exercise focused on the claim that university faculty members are justified in incorporating discussions of ethical issues into basic life science courses.

The third part of the course consisted of lectures and discussions designed to give students insights into reproductive biology and assisted reproductive technologies. The discussions during this segment of the course were purposefully kept at a somewhat rudimentary level to prevent students who lacked background in reproductive biology from feeling overwhelmed and becoming disenchanted with the course. The discussions also focused on domestic farm animals with the intent of keeping discussions less emotional than could potentially occur with discussions focused on humans. Topics discussed included reproductive anatomy and physiology, the beginning of life, artificial insemination, embryo transfer, gamete and embryo cryopreservation, in vitro fertilization, gender selection, and various embryo manipulations (e.g., cloning and gene transfer).

The fourth and final part of the seminar course consisted of student-developed presentations on some topic pertaining to bioethics. Students were required to have their topic approved by the course instructor to avoid having all

student presentations being made on the same topic. Two weeks in advance of their presentations, students were required to submit to the course instructor a one-page written summary of their presentation. As a part of this summary, students were required to clearly state the bioethical issue around which their presentation was based. In addition, students were required to incorporate at least one peer-reviewed scientific journal article, published within the past four years, pertaining to their chosen bioethical issue. The instructor reviewed the summary, made suggestions for potential revisions, and returned the edited summary to the students. Students revised their summaries and returned them to the course instructor who circulated the summaries to other students enrolled in the course one week in advance of the student presentation.

Students were required to utilize some type of visual aid during their presentation, and presentations were evaluated not only by the course instructor but also by the students in the course.

Student evaluations of the seminar course were also solicited by the university honors program at the end of the semester. These evaluations were shared with the course instructor after final course grades had been submitted.

Results

Enrollment in “Assisted Reproductive Technologies: Biological and Ethical Considerations” ranged from 10 to 15 students, with an average enrollment of 13 students. In the seven semesters the seminar course was taught, students from 36 different majors based in six different colleges successfully completed the course.

Students from the business college who took the course were majoring in marketing, finance, accounting and transportation and logistics. Students from the design college who took the course were majoring in community and regional planning, art and interior design, art and graphic design, design, architecture, and art & design. Students from the engineering college who took the course were majoring in computer engineering, aerospace engineering, chemical engineering, materials engineering, and mechanical engineering. Students from the college of family and consumer science (later named human sciences) who took the course were majoring in health and human performance, hotel, restaurant and institutional management, apparel merchandising, design, and production, kinesiology, and nutritional science. Students from the college of liberal arts and sciences who took the course were majoring in Spanish, biochemistry, political science, biology, psychology, philosophy, and biological/pre-medical illustration.

Students from the college of agriculture (later named agriculture and life sciences) who took the course were majoring in zoology, genetics, agricultural business, agricultural education, biology, microbiology, agricultural biochemistry, animal science, and dairy science.

Iowa State University Animal Industry Report 2011

The student presentations were based on a very diverse set of topics, although the vast majority tended to have a human medical ethics focus. Examples of the student presentation topics focusing on animals included: Should monkey embryo splitting be used to produce identical twins for study of human diseases? Is it ethical to use cloned meat animals as a source of human food products? Using Reproductive Technologies to Save Endangered Animals: Is This What Mother Nature Intended? Should transgenic animals be used for the betterment of the human race? Is it ethical to use sexed semen to alter sex of dairy calves?

Examples of the student presentation topics focusing on human medical ethics included: Is it morally acceptable to sell human ova for profit? Should preimplantation genetic diagnosis be used to select for the sex and genetic make-up of children? Should posthumous sperm donation be used for conception? Should there be an ethical delineation between discarded (IVF) embryos and embryos created specifically for embryonic stem cell research? Should assisted reproductive technologies be offered to HIV-infected patients? Is it ethical to transfer multiple embryos to a surrogate, and should multifetal pregnancy reduction be allowed?

Discussion

This honors seminar course evolved considerably over the semesters it was taught. Initial student feedback suggested that the course instructor was spending too much time on traditional lectures and not enough time on discussion/student interactions. Although the instructor felt that it was necessary to provide technical background information on reproductive biology, students indicated their desire to have such information available to them on a class web site or in a course packet, thus enabling the instructor to use the limited class time for discussions and interaction. Students cited the write-pass exercise as a good mechanism to teach critical thinking skills while concurrently teaching about bioethics and facilitating student-student and student-instructor interactions.

Students also requested a lecture on assisted reproductive technologies in humans. Even though the instructor initially felt that limiting reproductive biology lectures to animals might prevent overly emotional debates and/or discussions focusing on religion, it became quite clear (through the student-developed presentations) that

students wanted to talk about the ethical issues with a human context.

A case study was introduced into the seminar course as a means of getting students accustomed to evaluating ethical issues and arguments. This case study was discussed the week immediately preceding the student presentations, and it served a valuable purpose of getting students comfortable discussing a controversial topic with their classmates in an instructor-led discussion. The case study was well received by the students enrolled in the course.

The student presentations were initially developed as 15-minute individual student presentations. However, it became readily apparent that it was not feasible to have three 15-minute presentations per 50-minute class period while having sufficient time for meaningful discussion on the topics presented. Thus, the individual student presentation format was changed to a group presentation. Teams consisting of two to three students were charged with developing a 25-30 minute presentation to be followed by a 20-25 minute discussion period. As the course progressed, however, some students requested a slightly different format to incorporate more interaction throughout their presentations. For example, some students wanted to use a game show type format to elicit greater participation of their classmates. Others administered a mini-quiz, giving a prize to the first student to submit a quiz with a perfect score. Yet others showed video clips and then moved immediately into a series of thought-provoking questions for discussion.

Course evaluations revealed that the vast majority of students were satisfied with the seminar course and would recommend it to other honors program students. Students provided positive feedback regarding the structure of the course as well as the teaching style of the course instructor. Most students left the course having a greater understanding and appreciation of bioethical issues facing society.

Acknowledgements

The author thanks the Iowa State University Honors Program for providing support for development of this honors seminar course. Gratitude is also expressed to Denny Marple for his enthusiastic encouragement of development of this course, to Gary Comstock for challenging me to incorporate bioethics into my teaching repertoire, and to the dozens of talented and motivated honors program students who provided valuable feedback and constructive suggestions for course improvement.