Topics in Bioethics: A Development of Student Perspectives

Keith A. Johnson
Biology Department, Bradley University, Peoria, IL 61625

Exposing students to current biotechnological and medical issues is eye-opening for many students in a way that is not always achieved through lecture-based learning. Lecture or investigative teaching styles provide a tremendous knowledge base for the students, but sometimes these teaching styles do not allow the student to fully develop, especially personal attitudes to issues in bioethics. Through online videos, Hollywood movies, guided readings and classroom discussions, students in this course are informed of some bioethical topics, encouraged to learn about other topics, and use this gained knowledge to develop personal positions regarding the value and/or risk of the issues. This course has been well-received by previous students as a favorite in terms of both topics covered and style.

INTRODUCTION

Bioethical issues are pervasive throughout society, and with the scientific progress and technical advances that scientists continue to develop, new bioethical issues are continually arising. The goal of most courses is for students to be able to amass and assimilate information for use, either later in the course or during future activities. This course, Topics in Bioethics, is designed to allow students to discuss and learn about different bioethical issues and to develop educated personal positions on these topics. Sometimes the students go into a topic believing they are on one side, only to find out that it is not a two-sided, black-and-white issue, but a series of intertwined issues separated by large gray areas.

For example, many students have heard about the medical testing atrocities of the Nazi camps in Germany during World War II. But they are shocked to learn that human experimentation has occurred in the United States and other countries over the past hundred years. Through a series of Hollywood films and popular and scientific readings, students are exposed to additional topics of gene testing, designer babies, cloning, and other topics. Students gather knowledge about the topic, including pros and cons of the different biotechnological issues and uses. During classroom discussions, students discuss the topic, and gain insight into different perspectives through the eyes of fellow students and through introductory readings.

COURSE SETUP

Before presenting students with any course materials or content, they are given a basic introductory survey (Appendix 1). This 1) provides insight into their prior knowledge and 2) serves as a first introduction to some of the topics that will be covered in the class. The course has been set up in five parts, the fifth part being student-chosen topics and student-led discussions. The primary topics that have been covered are listed in Table 1, including movies that have been shown during one class period and some suggested readings. Additional topics that have been suggested or covered by students are listed in Appendix 2. The course is offered in a single three-hour time slot, allowing the instructor to introduce the topic to be viewed and complete

<table>
<thead>
<tr>
<th>Topic</th>
<th>Film</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction</td>
</tr>
<tr>
<td>Week 2–3</td>
<td>Human testing</td>
</tr>
<tr>
<td>Week 4–6</td>
<td>Genetic screening</td>
</tr>
<tr>
<td>Week 7–8</td>
<td>Designer babies</td>
</tr>
<tr>
<td>Week 9–11</td>
<td>Cloning &amp; human cloning</td>
</tr>
<tr>
<td>Week 12–14</td>
<td>Student-led presentations and discussions</td>
</tr>
</tbody>
</table>

a See Appendix 1 for reading assignments.
b For additional movies, see Shapshay (3).
c See Appendix 4 for links to short films about these topics.

Corresponding author. Mailing address: Bradley University, 1308 W. Bradley Avenue, Peoria, IL 61625. Phone: 309-677-3015. Fax: 309-677-3558. E-mail: kajohnso@bradley.edu.
†Supplemental materials available at http://jmbe.asm.org

©2014 Author(s). Published by the American Society for Microbiology. This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial-NoDerivatives 4.0 International license (https://creativecommons.org/licenses/by-nc-nd/4.0/ and https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode), which grants the public the nonexclusive right to copy, distribute, or display the published work.
the movie in one class period. Students are asked to read relevant literature, including popular literature and historical reports (Appendix 3), before the subsequent class period. Additional online videos (Appendix 4) are also made available or shown. Students are provided with some guiding questions to facilitate the topic discussion (Appendix 5).

During the class period following the introduction and movie, students are expected to openly discuss the topic and work through the questions provided (Fig. 1 and Appendix 5) and any additional questions that arise. The role of the instructor is solely that of facilitator, to assure that the science is sufficiently understood during the discussion and the group stays focused on the topic(s) being discussed. Additionally, the instructor makes certain that both sides of the topic are presented. The students discuss the pros and cons of the topic(s) and develop their own perspectives and opinions. They are assessed based on their willingness to participate in the discussion. A class size of 8 to 12 is recommended for inclusive discussions. Students with differing levels of biological training have been invited to take this course. One semester of freshman biology is suggested. The past two iterations of the course have included university honors students.

Keeping topics broad is important to allow the students to see the breadth of topics and to explore aspects of interest to them. As an example of the breadth of the topic of cloning, a flowchart of the potential subtopics is shown in Figure 2. Having broader topics allows for classes to discuss different subtopics that might be of more individual interest and allows for a more far-reaching introduction to the technology of cloning. The list of discussion questions for each individual topic has been designed to lead the discussion to include the breadth of the topics.

**GRADING**

Student assessment is based on three aspects—participation in discussions, effective written communication, and presentation of a well-prepared topic.

**CLASS PARTICIPATION**

Class size is critical in having effective student participation, with 8 to 12 students being an optimum number for discussions. Students are assessed following each discussion and provided with feedback designed to improve their participation in future topics through a course website. It is also important to provide feedback to students who dominate the discussion to encourage them to allow others to participate.

**EFFECTIVE WRITTEN COMMUNICATION**

With each topic, students were required to turn in an electronic version of a six- to eight-page (double-spaced) essay. The five position papers were each assessed for 10% of the final course grade. Students were required to present different sides of the topic or subtopics. Essays were graded on the quality of writing and the accuracy of information (science or historical fact).

**PRESENTATION OF A WELL-PREPARED TOPIC**

One of the goals of the student-chosen presentations is to create an effective learning environment. Students are

- Why was the Tuskegee study initiated?
- Why was the study allowed to continue?
- What role does informed consent play in the use of human subjects in research?
- At what point in the study do you feel that it may have become ‘unethical,’ if there was such a point in your opinion?
- With knowledge of the previous study (Oslo study) on the progression of untreated syphilis in Caucasian males, what was the goal of the Tuskegee Study? Would the completion of this study seem like an important addition to scientific knowledge? Is race enough of a difference to warrant repeating a study? What are major differences between the studies (timing)? How might your views be different if you were back in the 1930s?
- How much should be offered (compensation) to a research subject to encourage them to participate in a research project?
- Is it right for some or any of the research subjects to know their disease state or treatment if not all of the subjects are so informed?
- What value is the research to the different individuals in the study (participants, researchers, supporting agencies, hospitals, non-participants)?
- Society has no problem with asking military personnel to die for their country; why can’t society tolerate people dying during medical research?
- People voluntarily engage in risky recreational activities; why can’t they consent to potentially hazardous medical experiments?

**Extensions**

- Is there value to human experimentation performed without informed consent, such as the Tuskegee Study or Nazi studies (1, 2)?
- Does the fact that scientific research should be repeated or reproduced need to be considered?
- Some journals (including the Journal of the American Medical Association, according to Moe [2]) will not cite Nazi studies. Why not?

**FIGURE 1.** Examples of questions for the human experimentation class discussion (following the viewing of the film Miss Evers’ Boys). For questions associated with other topics, see Appendix 5.
paired up by the instructor to mix majors to allow for differences in philosophies and understanding. Students are encouraged to introduce a topic through a PowerPoint presentation and online videos. Students also serve as the leaders for the class discussion. The student topics should be covered in one to one and a half hours. The student presenters are required to provide two articles for the class to read prior to the discussion, with these articles being popular reading (e.g., news articles or short review articles) rather than scientific literature. To facilitate productive discussions, the topics are approved (sometimes focused, sometimes broadened) several weeks prior to the presentation, papers are made available one week prior to the presentation, and students prepare discussion questions. Two student presentations are given in one class period. The topic presentation, discussion leadership, preparation, article choice and questions provided for the discussion account for 20% of the overall course grade. The students who deliver the presentations also write their fifth position paper on their chosen topic.

**DISCUSSION**

Each iteration of the course has been well received by students. The informal feedback suggests that the students enjoy the non-lecture style course, which facilitates their ability to develop opinions and to express those opinions through discussion and writing. Students have indicated that they gain alternative insight into topics through their classmates during the discussion period.

**SUPPLEMENTAL MATERIALS**

- Appendix 1: Pre-course survey to be completed at the start of class
- Appendix 2: Student topics and additional topics that could be covered
- Appendix 3: Topics with readings and/or movies
- Appendix 4: Online movie resources
- Appendix 5: Discussion questions for other class topics
- Appendix 6: Results from cloning survey (Spring 2014)

**ACKNOWLEDGMENTS**

The author declares that there are no conflicts of interest.

**REFERENCES**