
The Eurasia Proceedings of Educational & Social Sciences (EPESS), 2016

Volume 4, Pages 573-578

ICEMST 2016: International Conference on Education in Mathematics, Science & Technology

PRESERVICE CLASSROOM TEACHERS' BIOETHICAL PERCEPTIONS

Gülbin ÖZKAN
Yildiz Technical University

Ünsal UMDU TOPSAKAL
Yildiz Technical University

ABSTRACT: Recent developments in biology and biotechnology have raised ethical issues. In order to live in more ethical world, it is most important to improve preservice teachers' capacity to make ethical decisions. The purpose of this research was to determine preservice classroom teachers' perceptions about bioethical issues. The research was conducted with 40 preservice class teachers (35 females, 5 males) from Yildiz Technical University, Faculty of Education, Department of Classroom Education in 2015-2016 academic year. In this study qualitative research method was used. For this purpose four bioethics scenarios was developed by the researchers and applied. The participants wrote their decisions about each scenario that included bioethical issues. The data was treated by qualitative data analysis - open coding. As a consequence of this research, it has been revealed that classroom teachers have decided mostly by their beliefs such as religious rather than bioethical perspective. At the end of the research, some suggestions were made concerning to have bioethics subjects in lessons, and to arrange preservice education for classroom teachers.

Key words: Bioethics, bioethical issues, biotechnology, preservice teachers

INTRODUCTION

Bioethics is the double sided relationship between biology and ethics. It includes everything from well-known debates such as the use of stem cells in medicine, to the impact of terrorism and war on Earth's environment, to how human populations alter the landscapes around them, to how research into these questions is conducted and results are shared (Dybas, 2003).

Advances in medical technology and biotechnology have caused the emergence of comprehensive new bioethical issues globally. Nowadays the ethical topics in science and biology have become increasingly important in education as a bridge for improving students' perspective. That's why ethics training has gained importance.

Ethics education has a positive effect on students' ability to make decisions about ethical issues (Hosmer, 1998). Bioethics education enables students' awareness of ethical disagreements and dilemmas and fosters good ethical decision making (Choe, Park & Yoo, 2014).

When examining the literature there is not much work in science education about bioethical issues (e.g. Keskin-Samanci, Özer-Keskin & Arslan, 2013; Dawson, 2007; Sadler et al., 2006; Larazowitz & Bloch, 2005; Sadler & Zeidler, 2004; Bryant & Baggott la Velle, 2003; Dawson & Taylor, 2000; Tsuzuki et al., 1998; Asada et al., 1996). In these studies with respect to bioethical issues deal with use of animals in experiments, prenatal genetic diagnosis and abortion, determining the gender or physical appearance of unborn babies, genetically modified organisms, genetic screening tests and therapeutic cloning, gene therapy and cloning, sociological, philosophical and ethical background; interactions of humans with the 'natural' world; biomedical topics; aspects of biotechnology, ethical concerns about animal experiments, environmental issues. In this study we will discuss donors, organ transplant, euthanasia, human milk bank topics with dilemmas.

- This is an Open Access article distributed under the terms of the Creative Commons Attribution-Noncommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

- Selection and peer-review under responsibility of the Organizing Committee of the conference

*Corresponding author: Gülbin ÖZKAN-icemstoffice@gmail.com

Incorporating ethical dilemmas into the classroom is one strategy for increasing student motivation and engagement with science content in bioethics education. Students notice the greatest changes in their own awareness of ethical issues and in understanding the connection between science and society (Chowning et al., 2012).

In order to help teachers appropriately manage and resolve ethical dilemmas and conflicts, it is of greatest importance to improve the bioethics education they receive while they are still pre-service teachers. If preservice teachers provide the awareness in bioethics, they will also enable effective education.

The purpose of this research was to determine preservice classroom teachers' perceptions about bioethical issues. Considering these issues, our future teachers have responsibilities as citizens and as teachers to prepare the next generation to be component in the consideration of bioethical issues and help their students discuss ethical implications of these issues.

This study was designed to answer the following research question: What are the preservice classroom teachers' perceptions about bioethics?

METHODS

Design of the Research

A qualitative approach was adopted. This approach helps the researchers to better understand the process of constructing meaning and describe them (Bogdan & Biklen, 1998). In this study, four bioethics scenarios was developed by the researchers and applied. The participants wrote their decisions about each scenario that included bioethical issues. In the analysis of the open-ended questions in the scenarios, the students' responses were first defined thematically. Decriptive content analysis of the data was performed by two researchers.

Sampling

The research was conducted with 40 preservice class teachers (35 females, 5 males) from Yildiz Technical University, Faculty of Education, Department of Classroom Education in 2015-2016 academic year.

In all students (40 preservice classroom teachers), scenarios were administered. The entire questions of response time was 45 minutes.

Data Collection

Scenarios that were prepared on the subjects of bioethics were developed to define the students' perceptions. In developing these scenarios, questions were prepared by researchers at the basis of the common issues among people. The scenarios were reviewed by two faculty members specialized in science instruction. After they examined questions, the questionnaire was given final form which contains 4 questions. Also, before before being presented to students, a pilot run was implemented with 5 students to see whether there was anything the students could not understand.

As part of the reliability study for the scenarios, two researchers analyzed students' answers. There was 95% agreement between the two analyses.

Four scenarios were prepared about bioethical issues as donors, organ transplant, euthanasia, human milk bank. The question below is an example from the scenarios (Figure 1).

Scenario 3, Esra has cancer disease which is too late to treat. Now she has unbearable pain. Esra has not decision making ability lost yet. She says to doctors that she is going to die and wants to end the her pain. She know to die, thus she wants to doctors end her life. What do you think about the decision of Esra who wants to end to life of her own accord?

Figure 1. Example of the Bioethics Scenario

Data Analysis Procedure

In a study conducted with Keskin-Samanci, Özer-Keskin and Arslan (2013), in determining suprathemes, they benefited from Principles of Biomedical Ethics (i.e. usefulness, harmlessness, respect for autonomy, and justice)

(Beauchamp & Childress, 1994) and the Basic Ethical Approaches (i.e. utilitarian, rights, justice, goodness of all, virtue) used in ethical decision-making processes and in ethical standard-setting (Velasquez et al., 2009). The classification of categories set forth by Keskin-Samanci, Özer-Keskin and Arslan (2013), given below were used to analyze the data obtained from scenarios.

- *The Utilitarian Approach* is concerned with doing the most good and causing the least harm for all those concerned– customers, employees, shareholders, the community, and the environment. It tries both to increase the good done and to reduce the harm caused.
- *The Rights Approach* is concerned with the duty to respect others’ rights.
- *The Justice Approach* is concerned with the idea that all equals should be treated equally.
- *The Virtue Approach*: Honesty, courage, compassion, generosity, tolerance, love, fidelity, self-control, and prudence are all examples of virtue. The virtue approach asks of any action “What kind of person will I become if I do this?” or “Is this action consistent with my acting at my best?”
- *The Normative Approach* sets forth specific conditions that label actions as ethical or unethical.
- *The Theological Approach* deals with actions motivated by religious rules.
- *Preference for the Natural*: In this approach, people prefer natural things. The important issue is not to pose a risk for the environment or the order of the nature.
- *The Science and Technology Based Approach* deals with scientific developments. According to this approach, science and technology contribute to human life.
- *Belief in Humans’ Superiority to Other Living Beings*: This anthropocentric approach assumes that human beings are superior to other living beings which are merely at the service of humans.

The classification of the responses to all scenarios in according to these nine subthemes was made by two researchers. The thematic classification of the reponses for the scenarios is given Results and Findings Section.

RESULTS and FINDINGS

To find out students’ views about donor, we asked to this scenario. Scenario 1 is included a dilemma about a girl in need of donor and her sister does not want to be donor. The percentages of preservice classroom teachers’ responding to this dilemma are presented in Table 1.

Table 1. Participants’ Approaches about Donors

Bioethics Approach	f
The Utilitarian Approach	7
The Rights Approach	4
The Justice Approach	4
The Virtue Approach	5
The Normative Approach	8
The Theological Approach	7
Preference for the Natural	3
The Science and Technology Based Approach	-
Belief in Humans’ Superiority to Other Living Beings	-

Majority of preservice classroom teachers have the utilitarian approach, normative approach and theological approach. Two students have no response this scenario. Some of the participants’ statements given below (Numbers in the paranthesis used instead of students’ name):

- *We should not be angry to a sister who do not want to be donor. We also should respect her decision. (12)*
- *I think sister who do not want to be a donor should be discarded. It is a disrespectful behavior to her sister. (25)*
- *If she don’t want be a donor, she can commit a great sin. According to our religion it is not acceptable. (32)*

The students were asked to opinion of giving organ if the brain death has occurred. Participants’ approaches are given in Table 2.

Table 2. Participants’ Approaches about Organ Transplant

Bioethics Approach	f
The Utilitarian Approach	8
The Rights Approach	7
The Justice Approach	4
The Virtue Approach	5
The Normative Approach	5

The Theological Approach	7
Preference for the Natural	3
The Science and Technology Based Approach	1
Belief in Humans' Superiority to Other Living Beings	-

Table 2 shows that in the participants generally have utilitarian approach, rights approach and theological approach. Some of the participants' statements given below:

- *According to our religion organ donate acquires merit. (3)*
- *Even if brain dead is occurred, I can not donate my relatives' and my friends' organs. Because it is very sad to think falling to pieces of him/her. Something will always missing. (16)*
- *I can allow. Because organ donate save the life. Maybe in this way someone can survive. (21)*

The preservice classroom teachers were asked to opinion of euthanasia. Scenario 3 is given as an example in a Methods Section. Participants' approaches are presented in Table 3.

Table 3. Participants' Approaches about Euthanasia

Bioethics Approach	f
The Utilitarian Approach	5
The Rights Approach	9
The Justice Approach	1
The Virtue Approach	-
The Normative Approach	7
The Theological Approach	13
Preference for the Natural	5
The Science and Technology Based Approach	-
Belief in Humans' Superiority to Other Living Beings	-

As seen in Table 3, most of the participants have theological approach about euthanasia. Some of the teacher candidates' responses given below:

- *I can say that as a religious, I do not make a decision about birth and I can not make a decision about death. Suffering will return to us as prize in other world. (8)*
- *Individuals can make a decision about death by themself. He/she should also be consulted to close friends and relatives. (18)*
- *If there is no possibility about living and he/she will die, we should be respected he/she decision. (19)*

A human milk bank, or breast milk bank is a service which collects, screens, processes, and dispenses by prescription human milk donated by nursing mothers who are not biologically related to the recipient infant. Scenario 4 is asked to participants: Would you prefer milk bank? Table 4 reveals that preservice classroom teachers' approaches about human milk bank.

Table 4. Participants' Approaches about Human Milk Bank

Bioethics Approach	f
The Utilitarian Approach	8
The Rights Approach	-
The Justice Approach	-
The Virtue Approach	1
The Normative Approach	5
The Theological Approach	16
Preference for the Natural	2
The Science and Technology Based Approach	8
Belief in Humans' Superiority to Other Living Beings	-

As seen in Table 4, most of the participants have theological approach about human milk bank. The utilitarian approach and the science and technology based approach are also preferred mostly. Some of the participants' answers given below:

- *I think that this situation have the useful effect more that the risk, thus the milk ban can be preferred. (6)*
- *I think science will solve the disadvantage sides of this milk banks. Because science and technology so advanced it will be positive for our future. (29)*

- *I do not want to give someone's milk to my child though one of my family members. That's why I can not give milk of someone who I have never met before. (39)*

CONCLUSION

This study aims to show preservice classroom teachers' values in their decision-making on ethical problems resulting from biological sciences within the perspective of 'bioethics' and 'bioethics education'.

In looking at the percentages of the preservice classroom teachers' responses it can be said that most of the participants are preferred the theological approach about bioethical issues. In that, their decisions deals with religious rules. Many teachers also have responded as The Utilitarian Approach. They can be tried both to increase the good done and to reduce the harm caused. It can be said that cultural and religious values affected their decisions.

A few teachers are adopting a scientific approach. Perhaps this frequency could be higher if they were science teachers. In the future bioethical scenarios may be attempted at various academic levels and on in science/biology education.

In a study conducted by Dawson and Taylor (2000), science students in two schools in Australia were taught biotechnology courses that introduced them to bioethics. At the end of the course, students completed a survey in which they made a decision about three bioethical dilemmas. The students' answers and reasons were compared with those of three experts. Researchers found that the majority of students tended to resolve and justify their decisions in a way that was naive, idealistic, and rights based.

Another study investigated Sadler and Zeidler's (2004) study examined the extent to which college students construe genetic engineering issues with dilemmas. The study specifically addressed gene therapy and cloning. It was found that students' responses were influenced by affective features such as emotion and intuition. In addition to moral considerations, a series of other factors emerged as important dimensions of socio-scientific decision-making. These factors consisted personal experiences, family biases, background knowledge, and the impact of popular culture.

As a consequence, it can be said that the character of individuals is the most important factor in improving the quality of bioethics thinking (Pauly et al., 2009). Bioethics education primarily aims to enable individuals to discover their own values regarding existing ethical problems, to question and evaluate with universal ethical values, and to gain decision-making skills in problem-solving processes (Keskin-Samanci, Özer-Keskin & Arslan, 2013). It is important that to improve awareness of individuals priorities and values.

RECOMMENDATIONS

The results of this study provide some perspective in terms of preservice science teachers' perceptions of bioethical issues. In the light of this study, the following recommendations can be given.

1. It can be recommended that teachers can do the 'bioethics education' through the scenarios.
2. The study were that the sample was very small. New studies can be made large number of participants.
3. In this study, no quantitative comparison had been made between the group in which students had the bioethical education and the group in which they did not. In the future experimental researches can be designed.
4. It is recommended that further studies comparing the two groups or more groups (different departments) can be designed.
5. Bioethical scenarios may be attempted at various academic levels and on in science/biology education.

The main limitation of the study were that the number of scenarios which were prepared was very small. For this reason, this study can only be regarded as restricted. For the future research, it can be arranged that new scenarios about another common bioethical issues.

REFERENCES

- Beauchamp, T. L., & Childress, J. F. (1994). *Principles of Biomedical Ethics*. Newyork: Oxford University Press.
- Bogdan, R. C., & Biklen, S. K. (1998). *Qualitative Research in Education. An Introduction to Theory and Methods*. Allyn & Bacon, A Viacom Company, 160 Gould St., Needham Heights, MA.
- Bryant, J., & Baggott la Velle, L. (2003). A bioethics course for biology and science education students. *Journal of Biological Education*, 37(2), 91-95.

- Choe, K., Park, S., & Yoo, S. Y. (2014). Effects of constructivist teaching methods on bioethics education for nursing students: A quasi-experimental study. *Nurse Education Today*, 34(5), 848-853.
- Chowning, J. T., Griswold, J. C., Kovarik, D. N., & Collins, L. J. (2012). Fostering critical thinking, reasoning, and argumentation skills through bioethics education. *PloS one*, 7(5), e36791.
- Dawson, V. (2007). An exploration of high school (12–17 year old) students' understandings of, and attitudes towards biotechnology processes. *Research in Science Education*, 37(1), 59-73.
- Dawson, V., & Taylor, P. (2000). Do adolescents' bioethical decisions differ from those of experts?. *Journal of Biological Education*, 34(4), 184-188.
- Dawson, V., & Taylor, P. (2000). Do adolescents' bioethical decisions differ from those of experts?. *Journal of Biological Education*, 34(4), 184-188.
- Dybas, C. L. (2003). Bioethics in a changing world: Report from AIBS's 54th Annual Meeting. *Bioscience* 53(9), 798-802.
- Hosmer, L., (1998). Adding ethics to the business curriculum. *Bus. Horiz.* 31(4), 21–34.
- Keskin-Samanci, N., Özer-Keskin, M., & Arslan, O. (2014). Development of 'Bioethical values inventory' for pupils in secondary education within the scope of bioethical education. *Eurasia Journal of Mathematics, Science & Technology Education*, 10(2), 69-76.
- Lazarowitz, R., & Bloch, I. (2005). Awareness of societal issues among high school biology teachers teaching genetics. *Journal of Science Education and Technology*, 14(5-6), 437-457.
- Pauly, B., Varcoe, C., Storch, J., & Newton, L., (2009). Registered nurses' perceptions of moral distress and ethical climate. *Nurs. Ethics*, 16(5), 561–573.
- Sadler, T. D., & Donnelly, L. A. (2006). Socioscientific argumentation: the effects of content knowledge and morality, *International Journal of Science Education*, 28(12), 1463-1488.
- Sadler, T. D., & Zeidler, D. L. (2004). The morality of socioscientific issues: Construal and resolution of genetic engineering dilemmas. *Science Education*, 88(1), 4-27.
- Sadler, T. D., & Zeidler, D. L. (2004). The morality of socioscientific issues: Construal and resolution of genetic engineering dilemmas. *Science Education*, 88(1), 4-27.
- Tsuzuki, M., Asada, Y., Akiyama, S., & Macer, D. (1998). Animal experiments and bioethics in high schools in Australia, Japan, and New Zealand. *Journal of Biological Education*, 32(2), 119-126.
- Velasquez, M., Moberg, D., Meyer, M. J., Shanks, T., McLean, M., DeCosse, Andre, C. and Hanson, K. (2009). *A Framework for thinking ethically*, Markkula Center for Applied Ethics at Santa Clara University. Retrieved from <http://www.scu.edu/ethics/practicing/desicion/framework.html>