

Communications:

Learning of Bioethics as Guide for Development of Modern Biology and Environmental Protection

*Eko Budi Minarno, Kholifah Holil, Kiptiyah, and Romaidi

Biology Department, Faculty of Science and Technology,
Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia.

Abstract: The development of modern biology has yielded tremendous benefits for the welfare of human life, but on the other hand also has a negative impact. Therefore, it is necessary to take bioethics to oversee the development of modern biology that is committed to the welfare of nature. Bioethics learning needs to be developed with the main orientation on the development of critical thinking skills of students. Methods that can be applied are through the development of decision-making abilities ABCDE models. In addition to oversee the development of modern biology, bioethics is also important to teach environmental ethic rooted in ethics and ethical bio-sentrisme ekosentrisme, for ethical anthropocentrism drove human behavior tend to be exploitative nature.

Keywords: *Bioethics, Environmental, Modern Biology*

1. Introduction

Since the end of the 20th century, biology has undergone rapid development. The focus of the study of biology has undergone significant changes, not only limited to the level of an organism or cell, but also deeper into the molecular level, that is known as molecular biology. The development of molecular biology begins with the discovery of the chemical structure of DNA by Watson and Crick in 1953 (Jenie 1997). Finally, these products are the basis for the development of modern biology.

The rapid developments of modern biology, has long been predicted to lead to ethical problems as well. The development of science and technology as an achievement, not infrequently also raises new issues that issues relating to ethics (Bertens 1990). Nor (1999) also argued that cloning, recombinant DNA, embryo transfer (ET) and in vitro fertilization (IVF) not only allowing "control" the process of life, but also brings new accountability to the community, so it is necessary prudence in applying. Prudence is necessary manifested inter alia in the form of study of the ethical aspects during the implementation of technology (Jenie 1997; Santosa 2000 and Djati 2003). In line with this, Johansen and Harris (2000) and Hasan (2001) also suggested that the results of research that does not consider the aspects of moral, ethical, social, and cultural rights, will cause a lot of problems in society. Sudarminta (1992) also suggests the need for a dialogue between ethics and science as ethical considerations that means that if the science is good for man in his totality as a human being and not only according to specific needs. Therefore, the ethical aspects related with the application of modern biology needs to get serious attention.

The rapid development of modern biology is not meant to be inhibited, but the truth is 'escorted' to keep it running in the benefit corridor of the people and the universe. This is consistent with the task of human as caliph on earth, as told in the Qur'an 10:14:

Then We made you successors on earth after them, to see how you would behave.

The task of caliph was manager that responsible for benefit. Thus biological scientists should not ignore the responsibility to humanity and the universe. Therefore, we need a signs that called bioethics to control modern biological research.

2. Bioethics and Ethical Decision

Ethical issues related to biology known as bioethics (Shannon 1995). Bioethics or biological ethics defined by Samuel Gorovitz (in Shannon 1995) as "critical inquiry about moral dimensions of decision-making in the context of biology." So bioethics investigates the ethical dimensions of the issues of technology, medicine, and biology related to its application in life (Shannon 1995). Another definition of bioethics is the study of ethical issues and decision making associated with the use of living organisms (Macer 2001).

Jenie (1997) stated that bioethics have role as security for biotechnological research. While Djati (2003), stated that bioethics is not to prevent the development of science and technology including biotechnology, but realize that science and technology has limits and responsibilities of humans and humanity.

On the other hand, the development of modern biological research such as the human genome, reproductive technologies, cloning, and transgenic are rapidly growing, which requires social policy and individual attitudes. This has led to the need for bioethical learning, because through this

*: Corresponding author: budi_minarno@yahoo.com, Jl. Gajayana No. 50, 65144-Malang, East Java, Indonesia.

study will be able to develop the ability to think and act in accordance with ethical and moral.

As an educational institution, university has a responsibility to improve thinking skills in establishing a decision in accordance with the ethical and moral. Therefore, the educational institution has the burden and responsibility for implementing the learning associated with ethics (bioethics) and assist students to develop ways of making ethical decisions (Kormondy in Margono 2003).

The realization of responsibilities of science and technology on humans and the universe can be done through the development of modern biological learning that integrates with issues related to ethics. Fullick and Mary Ratcliffe (1996) and Johansen and Harris (2000) asserts, through the integration of science with ethics are expected to contribute to the ability of learners in decision-making which related to ethical problems.

3. Bioethics and Religion

Is teaching bioethics is still needed, while on the other side students have received lectures religion? Related to this question, it can be argued that the teaching of bioethics is still necessary. In general it can be said that bioethics (as a branch of ethics) will substitute for religion, not contrast with religion, even required by religion (Suseno 1987). Suseno (1987) stated that there is a moral problem in the field of religion that can not be solved without the use of ethical methods. The problem is about interpretation of the commandment or law contained in the revelation, and the second is how moral issues such new IVF, abortion, cloning, sperm banks, euthanasia, and others that are not directly addressed in Revelation, can be solved in accordance with the spirit of the religion.

What about the Islamic religion, it is still need for bioethics? Because bioethics is a branch of ethics, it is widely used in the discussion of ethical terms. Sutiah (2003) argued that ethical, moral, and moralities are closely connected one with other. Ethics and morals as the study of good and evil an act, is determined based on the mind and habits of the people, while the morality based on revelation. However, ethics, morals and morality still need each other, because in practice, norms of morality in the al-Qur'an and as-Sunnah are still a textual ("not ready"). To implement the morality contained in the Qur'an and al-Hadith, reasoning and ijthihad is needed by the people. So that, the existence of ethics and morality is needed in order to define and operationalize the provisions contained in the morality of the Qur'an and al-Hadith. Bertens (2005) said that ethics are not talking for a homogeneous community, because the ethical turn to a public forum just depend on the ratio. Based on this description, bioethics as a branch of ethics is needed as a reasoning or ijthihad associated with the development of biology and technology.

Thus, teaching bioethics is no problem with Islam, even needed, because bioethics emphasize on the development of thinking to determine the good and bad side or ethical dimensions of modern biology, and technology related to life, while Islam strongly emphasizes the importance of thinking. The Messenger of Allah gave a statement about the role of reason in religion "Religion is the use of reason, no religion

for people who are not intelligent, al-Hadith)". Human imperative to always use their reason and mind had been said by God in the QS Al-Ghosyiyah, verses 17-20:

"..... Do they not look at the camels—how they are created? And at the sky—how it is raised? And at the mountains—how they are installed? And at the earth—how it is spread out?"

The importance of the development of thinking skills is very necessary to get attention. As stated by Corebima (1999), that in learning, reasoning by the student or the student must be managed as well (directly, planned and deliberate). The failure of learning today is related with not managed thinking or reasoning aspect of students by well. On the other hand, thinking skills, especially critical thinking, is a fundamental part of the maturity of human beings in the era of globalization (Liliasari 2000). Neglect of critical thinking skills, will lead to an inability in facing competition in this knowledge century.

4. Ethics Theory in Decision-Making for Bioethics Dilemma

The development of science such as biology, has led to serious dilemmas and profound, challenging our value system and culture based on these values (Shannon 1995). There are 2 basic theories in the ethical decision-making that often must be performed with respect to bioethics, *consequentialism*, and *deontology* (Shannon 1995, Johansen and Harris 2000).

In consequentialism, the pros and cons of action is not determined on the basis of principles, but investigate the consequences of actions. Hence has the name "consequentialism ". This method tries to predict what will happen, if we behave in different ways and compare their results with each other. What moral or morality of an action is determined through an evaluative process. With consequentialism, one person is not enough to do good, but they should know the best of all the good action that provide the greatest benefit for greatest number of people (Mackinnon in Johansen and Harris 2000).

The term "deontological" comes from the Greek word *deon*, meaning "duty / obligation / necessity / principles" (Shannon 1995, Johansen and Harris 2000). Deontological ethics is a method of decision-making that began by asking "What do I do?" Or "What is my duty?" According to this view, the proper conduct that must be followed by someone is following some principles wherever he carried. In this case they do not care about the consequences. Once the requirement or obligation established, then it is clear what actions should be done. So get to know the rules and know the obligations, it becomes clear what is ethical and what is not ethical. The biggest problem is deontological is insensitive to the consequences of actions.

What about Islam? Islam places great emphasis on thinking skills, ethical decision was made through a meticulous consideration for the benefit and disadvantage of something. Consequentialism is more appropriate in Islam to seek the solution to the dilemma of bioethics cases (cases that give rise to debates concerning the application of biology or

biology-based technologies). Learning of bioethics can be done with determining ethical decisions through the study of the risks and benefits, the decision that have most benefit with the least amount of disadvantage.

Prophet has taught about developing the mindset that "Religion is the utilization of reason, no religion for people who are not intelligent". Based on this, one of important thing that should receive attention in the teaching of bioethics is the ethical decision to not teach or give examples of ethical decisions to be taken, but rather emphasize how or the process for ethical decision making.

5. Decision Model for Bioethics Dilemma

The following description is a model ABCDE (Johansen and Harris 2000) which can be used in ethical decision-making.

5.1. ABCDE Model

In this model, students can be asked to think of contradiction arguments, the benefits and advantages, as well as the acquisition of the final decision based on personal honesty. The steps in this model are as follows:

- A. Argument. Insist on students to give a simple argument, short / efficient before reviewing the other side of the argument.
- B. Both Sides. Ensure that an argument has two or more sides that can be approached from the perspective of the consequences. Remind the students to make a decision with consequences. It is important to encourage students to see that there is another side.
- C. Costs and Benefits. Using the information, which they have developed, related to the advantages and disadvantages of each argument.
- D. Decision. The use of open discussion and debate, so that students can reach a decision or conclusion. It does not mean the whole class needs to agree. Anyway, this is a very valuable thing to obtain a final decision, because this also reflects processes in the wider society. The possibility of a decision is approved by a majority of voters or by consensus, or not everyone agrees, but the main thing is the decision making process has been followed and students to be part of the decision-making process.
- E. Evaluate. All the arguments, advantages and disadvantages, its benefits should be evaluated.

This model has the advantages such as easy to explain and offer the decision-making process directly. In addition, this model also provides a forum to explain the values that are held by the model and can understand the views of others. Through this process, students will find new information, analyze the views of others, make contrast with what they have, and develop arguments. The decision as part of this process provides an opportunity to students to learn to accept socially and morally. In the evaluation step, it can be seen the consequences of the decisions taken. The use of this model will not make everyone happy or agree, but will offer students an opportunity to examine the ethical decision-making process by investigating matters beyond the values they have.

6. Application of Learning Bioethics for Environmental Education

The paradigm of human on the environment needs to be changed in order to make the attitudes and behaviors of men more wise and prudent of understanding nature. Global environmental crisis come from fundamental errors or philosophical in understanding perspective about themselves, nature, and human's place in the overall of ecosystem. Errors perspective comes from ethical anthropocentrism that sees human beings as the universe. Humans are considered to be outside and separate from nature. Nature is only tools for satisfying human. This current perspective results in capitalistic attitudes and behavior which is exploitative without any concern on nature. The environmental crisis can be solved only by changing perspective and human behavior on nature from ethical anthropocentrism to biocentrism and ecocentrism ethics. Ethical anthropocentrism tend to make human behavior exploitative to nature.

For example Prophet *sall Allaahu 'alay-hi wa- sallam* (May Allah pray on him and grant him peace) in *hadith* Bukhari said: "It is not a Muslim who plants a crop, and then eaten by birds, humans or animals, but it is (considered as) alms for him". The Prophet also said: "If you're determined to die tomorrow morning, while your hands are palm seeds, then plant!" Even when the Prophet Muhammad *sall Allaahu 'alay-hi wa- sallam* (May Allah pray on him and grant him peace) makes instruction the army in war, he always gave the message "you do not kill women, children, men the aging, do not you broken places of worship, and do not cut the trees ". In emergencies of war only forbidden to cut down trees, even in peacetime, tens of millions of hectares of forests are destroyed.

The paradigm of human on the environment can be changed through learning bioethics or environmental ethics. Students were taught to take decisions related to the environment, because our life is making decisions. Environmental ethics demand that ethics and morality are also applied to the biotic community or ecological community. Environmental ethics must also be understood as a critical reflection on the norms and principles or moral values that have been known to the human society to be applied more widely in the biotic communities and ecological communities. In addition, in the perspective of environmental ethics, human should treat nature not merely in relation to the interests and the benefit of man.

Beside the topics of the product development of modern biology, bioethics learning is likely to be filled with environmental topics as the following, demonstrating the role of bioethics, for example:

- In this 20 years, there will be no low and high land tropical forests and in Sumatra, Kalimantan and Sulawesi, if the acceleration of deforestation in Indonesia as soon as it is today.
- Land will be turned into oil palm, rubber, coffee, cocoa, and others.
- Some flowering plants along with a number of insects, fungi, bacteria, and others will disappear forever, a new environment might not support the growing development of these living creatures.

- There is a possibility of a plant that has a commercial value has not been disclosed or identified include *gaharu*, *gambir*, *nilam*, and others.
- Many plants are fast disappearing; romp with time.

7. Conclusions

Bioethics (ethics of biology) is required as the guardian of modern biological research and also saving the environment. Learning bioethics is not done by suggesting a decision to be taken by learners. Islam teach development of critical thinking skills through the analysis of beneficiaries-disadvantages in decision ethical in facing bioethics dilemmas as a result of the development of modern biology, and action on the environment. Bioethics should be taught through thinking and predicting the consequences of actions taken, in this case also predicts benefit and disadvantage that will appear.

Discussing the decision through various opinions both pro and contradictive is very valuable to develop insights and critical thinking skills of students. The process to obtain a decision of a phenomenon of modern biology need to be taught to students based on constructivist philosophy (that knowledge must be constructed by the students and not be doctriated), so that students as biological scientists can consider and measures some action that will be carried out as proposed by Prophet about the development of mindset.

8. References

- Daar, A.S., Binsumeit, A., and Al Khitamy (2001) Bioethics for Clinicians: 21 Islamic Bioethics. *Canadian Medical Association Journal*, 164(1): 60-63.
- Djati, M.S. (2003) Diskursus Teknologi Embryonic Stem Cells dan Kloning dari Dimensi Bioetika dan Relegiositas (Kajian Filosofis dari Pengalaman Empirik). *Jurnal Universitas Paramadina*, 3(1): 102-123.
- Ebrahim, A.F.M. (2000) *Kloning, Eutanasia, Transfusi Darah, Transplantasi Organ, dan Eksperimen Pada Hewan Telaah Fikih dan Bioetika Islam*. Terjemahan oleh Mujiburohman, Serambi Ilmu Semesta, Jakarta.
- Fullick, P., and Mary, R. (1996) *Teaching Ethical Aspects of Science*. Hobbs The Printers Limited, Hampshire..
- Gilbert, S.F., Tyler, A.L., and Zackin, E.J. (2005) *Bioethics and The New Embryology: Springboards for Debate*. W.H. Freeman and Co., Gondonsville, USA, pp261.
- Hasan, A.M. (2001) Pentingnya Pengajaran Etika Biologi (Bioetika) dalam Menghadapi Abad Pengetahuan. *Jurnal Pendidikan Nilai Universitas Negeri Malang*, 8(1).
- Jenie, U.A. (1997) *Perkembangan Bioteknologi dan Masalah-Masalah Bioetika yang Muncul*. Temu Ilmiah Regional, Surabaya.
- Johansen, C.K., and Harris, D.E. (2000) Teaching the Ethics of Biology. *The American Biology Teacher*, 62(5): 352-358.
- Liliasari (2001) Model Pembelajaran IPA untuk Meningkatkan Keterampilan Berpikir Tingkat Tinggi Calon Guru Sebagai Kecenderungan Baru pada Era Globalisasi. *Jurnal Pengajaran MIPA*, 2(1): 55-65.
- Macer, D.R.J. (1994) *Bioethics for the People by the People*. Eubios Ethics Institute, Christchurch, N.Z.
- Margono, D. (2003) *Analisis Kemampuan Berpikir Moral terhadap Tes Dilema Bioetika pada Siswa SMU Jember*. *Teknobel*, 4(1): 9-14.
- Morris, L.J. (1994) Bioethical Dilemmas: Decision-making and the Human Genome Project. *The Science Teacher*, 61(2):39-41.
- Muchtadi, T.R. (2007) Perkembangan Bioetika Nasional. *Makalah Seminar on Ethical Issues in Research in Reproductive Health*, Surabaya.
- Nor, S.N.M. (1999) New Reproductive Biotechnology, Values and Society. *Eubios Journal of Asian and International Bioethics (EJAIB)*, 9: 166-169.
- Santosa, H. (2000) *Landasan Etis bagi Perkembangan Teknologi*. Tiara Wacana, Yogyakarta.
- Shannon, T.A. (1995) *Pengantar Bioetika*. Terjemahan oleh K. Bertens, Gramedia Pustaka Utama, Jakarta.
- Suseno, F.M. (1987) *Etika Dasar*. Kanisius, Yogyakarta.
- Sutiah (2003) Metode Pembelajaran Aqidah Akhlak dengan Pendekatan Perkembangan Kognitif. *El-Hikmah*, 1(1): 25-49.