

# The Meaning and Structure of Ecological Education of Biology Specialists in Kazakhstan

E. Tazabekova, B. Amirasheva, and L. Amirasheva

**Abstract**—This article examines the nature and structure of ecological education of biology specialists in Kazakhstan. Also characterizes the ecological education in high school and specific features in training of biology specialists.

**Keywords**—Ecological education, environment.

## I. INTRODUCTION

TODAY the problem of continuous ecological education is on the state level. The goal of ecological education in the training of biology specialists in high school is the biologists' explanation of the most effective ways of the harmonization of human nature, society, nature and the environment. Also holds a special place education of environmentally literate, humane specialist capable to protect the environment, to take care of it in the use of the environment and its natural resources.

Ecological education is multi-level process aimed at knowledge, skills of Natural Sciences, their exchange for practical skills, manifest of biologists' active role in protecting the environment, the development of ecological thinking, ecologically aimed behavior.

To date, in order to improve the important role of ecological education in the global and national levels, through actions aimed at harmonizing the relationship between man, society and nature, made the following domestic and foreign instruments and legislation, the Law of the Republic of Kazakhstan "On Education" (1999, amendments to the 2007), the Law "On environmental protection" (1997), "Strategic Program 2030 Sustainable Development of the Republic of Kazakhstan" (1996), "The Concept of Ecological Security of the Republic of Kazakhstan" (1997), the Law "On Environmental Impact Assessment" (1997), "National Strategy for Ecological Education of the Republic of Kazakhstan" (1998), "Ecological education program" (1999), "The state standards of secondary education of the Republic of Kazakhstan" (1998), "The concept of ecological security of Kazakhstan for 2004-2015" (2004), "Environmental Code of

the Republic of Kazakhstan" (2007), the Program "Man and Biosphere" organized at the United Nations (1970), the Stockholm Conference "Protection of the environment and ecological education" (1972), conference in Tbilisi (1977), International Conference "Earth Summit" in Rio-de-Janeiro (1992), etc. These documents accept prerequisites for the formation and development of continuous ecological education in the state [1-13].

The most basic of these documents are - "Environmental Code of the Republic of Kazakhstan", which identifies "ecological education and awareness in the field of environmental protection, skills development, ecological education in educational institutions" [10].

Ecological education as a separate domain in the theory and practice of higher education began to develop in the 60s of the twentieth century, marked by the introduction of the environmental elements of the content of biological education, and the curriculum was implemented subject "Protection of nature". It identified the following ways the future of ecological education specialist:

- study of social science and teaching students the ideological aspects of the environment protection;
- study of natural science and teaching scientific basis and practical skills in the protection of nature;
- deepening and codifying specific courses of training students in the protection of nature;
- organizing social activities of students on environmental protection;
- in order to protect nature a knowledge of the research work and the protection of nature are taken in the basis.

Also the importance of research scientific and methodical way, content of opportunities of ecological education are given in the study of individual subjects (M.N.Sarybekov, A.Karamergenov, V.M.Senkeevich and others [14, 15, 16].

Also in the study of individual subjects given the importance of research of scientific and methodical ways, contents, opportunities of ecological education (M.N. Sarybekov, A. Karamergenov, V.M. Senkeevich and others [14, 15, 16].

In 70s of XIX century society paid attention to the impossibility of solving environmental problems through technical and technological methods, the impact of environmental information on the environmental consciousness of the person, the possibility of a change in its relation to nature, the need for nature as a value. Ecological education is the leader in the disclosure of the moral context of the relationship between man and nature, the training of the mind and the senses, the formation of consciousness.

E. Tazabekova is with the faculty of natural sciences, Magistracy and PhD doctoral institute of the Kazakh national pedagogic university named by Abay, Almaty, 050010 Kazakhstan as Professor phone: + 7 (701)-333-7755; (e-mail: ett56@mail.ru).

B. Amirasheva is with the faculty of natural sciences, Magistracy and PhD doctoral institute of the Kazakh national pedagogic university named by Abay, Almaty, 050010 Kazakhstan as senior lecturer phone: + 7 (707)-230-9019; (e-mail: bahitka\_85@mail.ru).

L. Amirasheva is with the faculty of natural sciences, Magistracy and PhD doctoral institute of the Kazakh national pedagogic university named by Abay, Almaty, 050010 Kazakhstan as master's degree of natural sciences phone: + 7 (707)-961-0311; (e-mail: lau\_87@mail.ru).

Since the 90s in the higher educational school system began to develop the fundamental concept of ecological education. Systematic ecological education of future teachers considered from different points of view: the integration of ecological education, and general scientific training to the development of ecological culture of the individual, the theory of the systems, complexity, etc.

From this position, it is believed that ecological education is a holistic system encompassing all human life, from the early age of the person the initial basis of moral value experience of interaction with the environment and outlook should be formed.

The result of regulatory documents analysis, adopted in the Republic of Kazakhstan, has shown that in high school ecological education for all degree courses in 1996-1999 were introduced in the course form "Fundamentals of Ecology", and in 2008-2009 as the training course "Ecology and Sustainable Development" (2 credits).

Today in Kazakhstan many people focus on the preparation of environmental specialists. According to data of the Ministry of Education and Science, future environmental specialists on environmental subjects ("Ecology and Monitoring", "Industrial Ecology", "Chemistry and Ecology", "Biology and Ecology", "Geography and Ecology") are prepared in 15 higher schools.

The ecological education system is supported by university graduates. Many institutions of higher education according to the nomenclature of specialties are training and specializing professional experts on environmental issues, including, along with educational and scientific and environmental training. For example, in KazNU named after Al-Farabi for the learning process has been prepared and implemented a comprehensive program of ecological education for students of all faculties. In ENU named after L. Gumilev, Kazakh State Academy of Architecture and Civil Engineering, KazNTU named after K. Satpaev, KazNAU and universities of other regions are training specialists in bio-ecology, biology, nature protection, etc. Also Institute of Ecology and Sustainable Development works in Almaty.

Thus, there are two main trends in the practice of methodical organization of ecological education in high school: 1) introduction of discipline "ecology" in the educational content of different levels, 2) the "ecologization" of all disciplines, that is interdisciplinary analysis of environmental problems. The prospect of a second trend creates a future specialist skills of taking rational, design, technological, economic or administrative decisions taking into account environmental factors, environmental expertise, coupled with the specific future of the student. Ecologization is a sequential process of technological, managerial, and other solutions to the efficient use of natural resources and preserve and improve the environment at local, regional, and global levels.

Process of ecologization of university disciplines relates to educational and extracurricular activities of the student based on the theory of integrity. Information on the protection of the environment is introduced tailored to each discipline.

In this case, *environmental training* in higher education is carried out in *two directions*:

- *general (basic)*, for all specialties ("Fundamentals of Ecological Knowledge", "Environmental Protection", "Environmental Economics", "Environment and Sustainable Development", etc.);
- *professional (in-depth)* designed to train environmental specialists in the departments of ecology, natural history, geography, chemistry, biology, geography, ecology, etc. ("Ecology", "Ecology and Nature", etc.), and training necessary for the production of "Applied Ecology", "Agroecology" etc.).

Today, much attention is given to the environmental problem. Working experience of modern society and ways of being affect the biosphere, violation of its natural evolution. The study of features of southeastern Kazakhstan landscape, the disclosure implications of exposure to modern anthropogenic effects and identification of measures to improve this region are an important issue.

Ecological education is a prerequisite for the destruction of the negative effects of human impact on the environment and acts as a factor shaping ecological culture of the individual governing human relationships in the "man-environment". Particular attention is paid to training, the formation of a professional culture of expert biologists. This is a relevant question, as essential to the activities of man outside of nature. It is known that the modern environmental damage, disturbing all of humanity, it harms created by human hands, as a result of human impact.

The crust is one of the most important components of the biosphere. Loess is the widespread soil-forming rock. Loess is about 4.2 million of the planet, or 3.3 percent of total land area. Compared to other breeds, more eroded loess. Therefore, research aimed at the restoration of the anthropogenic disturbance of the loess soils in the foothill valleys of the southern and south-eastern regions of Kazakhstan today is the actual problem. Analysis and modeling ecological aspect of education in the loess soil formations.

Also today historical justification of an entangled state of social and environmental issues adopted evolutionary. This will examine the important theoretical and practical aspects of solving the issues of environmental protection.

Therefore, ecological education is seen as an important direction international environmental movement, educational research and improvement of the educational system. Ecological education and training, supported by all the infrastructure of society, helps to shape the modern man who is aware of himself a part of the whole world that can exist in harmony with nature.

Despite this, the impact of labor activity of society and ways of being on the biosphere, the violation of its natural evolution, extinction equilibrium in a natural system, the continuous pollution of the atmosphere, hydrosphere, lithosphere, technogenic desertification of region, soil tiredness, water drying, forest depopulation, genetic violation of nature fund, increasing the area with soil erosion resulted due to human activity, the conversion of part of the ecosystem

in agrocenosis and technological landscapes, the transition to succession; flushing brown humus layer of the soil, spread of bare yellow loess soil and clay, as well as the deformation of the system of environmental relations and the lack of responsibility of the future as a result of environmental crises, low level of environmental training competitive specialists in contemporary ecological education and the lack of a mechanism for its implementation require the formation of a new direction of environmental education in the preparation of environmental specialists.

Ecological education - as a basic component of ecological culture of the individual is justified as value directed, aimed and systematically executed process of formation of ecocentric characteristics. Its main theories are interdisciplinary, system, variety, consistency, scientific, practical direction theory, the integration of ecological education and vocational training, ecocentric theory of reflection, etc.

Ecological education at the university should form an ideological paradigm and environmental expertise. Ecologization of special disciplines allows students to master the theoretical knowledge and practical skills for effective environmental management. Ecological education at the university requires a new environmental knowledge, professional biological knowledge, specialization courses.

The successful solution of socio-economic problems of the modern Republic of Kazakhstan due to the development of education. One important condition is the introduction of the system of continuous ecological education as a means of building public and individual environmental consciousness. Today we need a new form of human attitudes, aimed at active study of the nature and use of it by humanity.

The purpose of the new paradigm of education should be the formation of man as an organic living entity, as an integral phenomenon (cosmic, biological, social, spiritual) that is in unity with nature. Ecologization of educational process will lead to the definition of professional tasks of the future expert, conscious understanding of consequence, getting used to their future careers. In modern times, to address environmental issues, a policy of training the new profile, ecological thinking and activities of future specialists. Therefore, to be aware that modern education is a change of values in the period of today's requirements of social development of man. This largely makes education axiological direction, it requires the implementation of measures ecocentric evaluation of practical and theoretical human activities change attitudes noospheric thinking. In this regard, it is particularly important to study the future professionals to provide new knowledge to evaluate the environmental effects of certain professional activities in their field in terms of protecting the environment and competent solutions to environmental problems, implementation and supply of clean technologies in cleaning anthropogenically disturbed landscapes.

Therefore, environmental training should be one of the foundations of the education system structure. In this regard, our research developed the methodology of ecological education in the preparation of expert biologists. Our prepared method consists of a special course "Evaluating ecosystem of

anthropogenically disturbed landscapes of the south-eastern foothills of Kazakhstan" and the theoretical and practical instruction "Biological basis of recovery of biogeocenoses of anthropogenically disturbed landscapes of south-eastern Kazakhstan" which will be introduced into the learning process [17, 18].

The importance of *developing the methodology* is in development for the students, future biologists, biological bases for the reconstruction of anthropogenically disturbed landscapes, assessing diversity of plants, animals and microorganisms, the state of education bioecological soil, the study of theory, techniques, and methods of environmental control soil. Improving outlook university students through discussions and views on the need to restore the anthropogenically disturbed landscapes, ecological thinking, ecological education, based on their knowledge from the fields of environmental science.

Preparation of future biologists in universities plays an important role in the steppe and experimental practices. These practices allow students to use the ecological theoretical knowledge as a professional, to explore its practical basis. Therefore students of specialty "050113 - Biology" chemical and biological faculty of KazNPU named after Abay before and after practice steppe were trained with this special course.

Discussion and summing up the views of leading scientists on the theory and practice of forming ecological education reveals the *following tasks* undertaken by ecological education system:

- *ecological culture* (the culture of behavior, the culture of consumption, professional environmental awareness and appropriate knowledge, abilities, skills);
- *environmental competence* (the ability to deal effectively with professional problems, practices, environmental action);
- *natural and social environment* (training, etc.).

Above students give an opportunity to highlight the *two systems in the structure of ecological education*: ecological knowledge pedagogical and methodological training (in sphere of ecological education).

## II. CONCLUSION

Overall, review and summarize what has been said in the course of the study revealed the following goal of ecological education:

- forming friendly relations of a man to nature, nurture the spirit of harmony between 'man-society-nature';
- creating a system of ecological education in the training of specialists in biology;
- upbringing sense of rectitude and responsibility to protect the environment in the preparation of expert biologists;
- being aware of the scientific advances in the field of ecology;
- knowledge of legal documents.

In conclusion, the goal of ecological education will allow biologists to determine the structure and components, the content of ecological education, to prevent human disturbance

in society, respect pravila existence of an environmental point of view, to establish a system of ecological education through education.

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**Erkyn Tazabekova (15.08.1956):** Professor of Magistracy and PhD doctoral Institute of the Kazakh national Pedagogic University named by Abay. Pro – rector on educational - methodical work and the international cooperation Kazakh agro technical university named by Seyfullin.

**Bahitkul Amirasheva (01.01.1985):** PhD student of Magistracy and PhD doctoral Institute of the Kazakh national Pedagogic University named by Abay. Master degree on natural sciences of Kazakh national university named by al-Faraby. Senior teacher faculty of natural sciences, Magistracy and PhD doctoral institute of the Kazakh national pedagogic university named by Abay.

**Laura Amirasheva (25.11.1987):** Master degree on natural sciences of Kazakh national university named by Abay.