

CHAPTER 3

THEORY AND METHODS OF VOCATIONAL EDUCATION

ENVIRONMENTAL EDUCATION AND EDUCATION OF FUTURE BIOLOGY TEACHERS

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Abstract. The article reviews and analyzes the state of environmental education and upbringing of future biology teachers. The purpose of the article is to establish the role of economic education in the education of future teachers of biology. To test the research hypothesis, various methods were used: conversation, observation, survey, questionnaire, methods of mathematical statistics for quantitative and qualitative analysis of experimental data, determination of the reliability of the results. The methodological basis for revealing the essence of the state of environmental education and upbringing of future biology teachers at the present stage of society's development is based on various approaches and principles. The necessity of improving and saturating the content of the educational process with environmental material and creating appropriate conditions for the environmental education of future biology teachers is proved. Environmental education and upbringing are becoming the core of modern education and serve as a key to the restructuring of its modern systems and society as a whole. The role of environmental education as the basis of a new morality and a support for solving numerous issues of people's practical life is especially relevant. The basic principles of environmental education and upbringing of future biology teachers are revealed, such as: the principle of practical orientation, the principle of continuity and consistency, the principle of activity and consciousness, the principle of nature correspondence, the principle of interdisciplinarity. The main approaches to the development of environmental education and upbringing are highlighted: natural science, naturalistic, global-biospheric, problematic, and value-based. The current state of development of environmental education and upbringing is characterized by the search for new ways of cooperation between teachers and students, during which the latter become initiative, independent and creative individuals.

Keywords: environmental education, principles of environmental education, approaches, principles, biology teachers, future biology teachers.

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Introduction. Environmental education and upbringing is currently one of the priority areas of work with young people, an organized and consistent pedagogical process. The organization of the process of environmental education requires a clear definition of all its links, identification of connections and dependencies, formation of a system of environmental knowledge, skills, attitudes, beliefs, moral qualities, and ensures the formation and development of a responsible attitude towards nature.

Environmental education and upbringing are becoming the core of modern education and serve as a key to restructuring its modern systems and society as a whole. The role of environmental education as the basis of a new morality and a support for solving numerous issues of people's practical life is especially relevant.

Environmental education focuses on the relationship between humans and their environment and forms a system of scientific knowledge, attitudes and beliefs that lay the foundation for a responsible and effective attitude towards the environment.

An important aspect in solving the problem of preserving natural resources is the education of people in the field of environment, environmental education of the entire population, especially the younger generation. The environmental problem grows into the problem of transforming the spontaneous impact of people on nature into a conscious, purposeful, systematically developing interaction with it. Such interaction can be realized if each person has a sufficient level of environmental culture and environmental awareness, the formation of which begins in early childhood and continues throughout life.

Literature review. The founders of the development of environmental education were I. Suravehina, O. Zakhlebnyi, I. Zverev, who substantiated the theoretical foundations, developed conceptual provisions and laid the foundation for environmental education. V. Bakirov, V. Krysachenko, N. Nazarova, V. Serikov dealt with the issues of environmental education in pedagogical theory and practice; S. Hlazacheva, A. Nekos, S. Shmaley - with the interaction of environmental concepts and modern trends in education.

V. Krysachenko, I. Pavlenko, G. Pustovit, S. Skrypnyk, L. Simonova were engaged in fundamental research in the field of environmental education.

A. Volkova in her research defines the place and role of environmental education in the lessons of the natural history cycle. She has developed samples of lessons with environmental content, proposed a system of work on environmental education when planning naturalistic work at school, and pointed out the effectiveness of work due to the combination of different teaching methods, which contributes to the sustainable formation of environmental knowledge [2].

Aims. The purpose of the article is to establish the role of economic education in the education of future teachers of biology.

Methodology. To test the research hypothesis, various methods were used: conversation, observation, survey, questionnaire, methods of mathematical statistics for quantitative and qualitative analysis of experimental data, determination of the reliability of the results.

The methodological basis for revealing the essence of the state of environmental education and upbringing of future biology teachers at the present stage of society's development is based on various approaches and principles.

Results. Nowadays, when environmental problems are becoming global in scope due to irreversible changes in the biosphere and limit human life opportunities, environmental education and upbringing also acquire a special social meaning.

The growing relevance of the problem of environmental education is caused by a number of factors:

- the need to improve the environmental culture of citizens;
- the need to constantly preserve and improve human living conditions on the planet;
- the need to solve urgent problems related to the reduction of living space per person;
- the need to preserve, restore and rationally use natural resources;
- low level of perception of environmental problems as personally significant;
- insufficiently developed skills and abilities of practical participation in environmental activities [3, c. 28].

The current state of development of environmental education and upbringing is characterized by the search for new ways of cooperation between teachers and students, during which the latter become initiative, independent and creative individuals. The role and place of the student in educational work is changing significantly, and the functions of managing this process by the teacher are changing. Today, students are required to acquire knowledge and be creative on their own, and teachers are tasked with facilitating this.

"Environmental education is a continuous process of training, education and personal development aimed at forming a system of scientific and practical knowledge, value orientations, behavior and activities that ensure a person's responsible attitude to the surrounding social and natural environment. Environmental education should represent a holistic system that covers the entire human life. It also aims to form a worldview based on the idea of unity with nature." [1].

Environmental education is a "conscious and systematic development of knowledge about the environment throughout life". Its main goal is to form an understanding of the environment, the specifics of its internal relations, the nature of anthropogenic impact, and the principles of harmonious development of humans and the natural environment.

By environmental education, I mean the development of will, feelings, and character traits that would manifest themselves in the correct (ethical) behavior of my students in relation to the natural environment. It should be voluntary and continuous throughout a person's life. The goal of environmental education is to form a similar consciousness that includes the concept of environmental morality - a balance between the perception of the environment, its upliftment, and the behavior of people in it.

Environmental education forms a person's worldview aimed at ensuring environmental protection and is a worthy platform for environmental education, which is a combination of various environmental knowledge, environmental thinking, environmental outlook, environmental ethics, and environmental culture. The main goals of environmental education are: mastering scientific knowledge about the environment, complex interrelationships in nature that have developed over a long period of historical development; formation of research knowledge and skills aimed at developing intellect, creative and business activity; understanding of modern environmental problems and awareness of their relevance to oneself; formation of environmental awareness and culture of the individual, awareness of being part of nature.

A. Zakhlebnyi actively worked on the theory of environmental education. Analyzing the relationship in the society-nature system, he identified the following features:

The development of industry on the planet leads to a violation of the integrity of the biosphere;

- industrial development leads to pollution with substances that were not part of the natural cycle of the biosphere (this, accordingly, leads to its gradual destruction);
- the disappearance of natural resources gives rise to new problems (the search for and use of new sources of energy and raw materials, which leads to new environmental problems).

A. Zakhlebnyi paid special attention in the theory of environmental education to solving the problems of developing a system of tasks aimed at developing students' value orientations and forming the need for environmental protection and ecological activities.

The theoretical model of environmental education (developed by A. Zakhlebnyi) contains four blocks:

- the first block combines the factors that determine the formation of the worldview, views, beliefs and actions of students;
- the second block includes factors that determine the properties of the student's personality in specific types of activity (behavior);
- the third block combines pedagogical conditions of influence on the student's personality (feelings, intelligence, etc.);
- the fourth block contains pedagogical means by which environmental education of students is provided.

A. Zakhlebnyi introduced the following into the content of environmental education of students:

- a system of knowledge about nature, society, principles of nature management, ways to optimize interaction in the society-nature system)
- a system of skills and abilities (intellectual and practical) of environmentally oriented activities;
- experience in studying and actual practical participation in nature protection;
- a system of norms that appear in the evaluative and emotional attitude to nature.

V. Nazarenko identifies different models of environmental education organization that are typical for secondary schools today. These include the inclusion of environmental information in traditional subjects; studying environmental issues in a specially designated subject; forming environmental knowledge in various subjects and then integrating it into a separate subject; and a complete reform of the educational process.

The main strategic directions of environmental education development are as follows:

- development of scientific foundations of continuous environmental education based on the National Doctrine of Education Development in the XXI century, achievements of Ukrainian and foreign pedagogical practice with the participation of the Academy of Pedagogical Sciences of Ukraine, leading scientists and practitioners of the educational sector, the Ministry of Ecology and Natural Resources of Ukraine, and public environmental organizations;
- gradual, step-by-step reform of environmental education and personal upbringing based on scientific and spiritual principles, taking into account national traditions, achievements and international experience;
- formation of generations with a new ecological culture, a new ecological outlook based on the principles of humanism, ecologization of thinking, interdisciplinary integration, historicism and systematicity in order to preserve and restore the nature of Ukraine and its biological diversity;
- development of international relations and cooperation in the field of environmental education and science, environmental protection, rational use of natural resources, preservation of the biosphere and civilization.

Discussion. An integral part of environmental education is the principles and approaches to environmental education itself.

L. Khomych identifies the following approaches to environmental education:

- practical, which arose as a result of socio-economic transformations in our country, the emergence of new types of educational institutions other than secondary schools; they require a new teacher with a holistic view of professional activity; the future teacher must act independently, master special skills and abilities of interaction and communication in the process of psychological and pedagogical training; in order for teacher training to meet modern requirements, it is necessary to intensify the development of the methodological and theoretical basis of teacher education;
- theoretical, due to both socio-economic and practical changes in the development of public education; teacher education is developing along the path of forming a holistic view of their professional activity in future teachers, so most pedagogical institutions of Ukraine include integrated courses of psychological and pedagogical disciplines in the curriculum and on this basis purposefully organize the formation of professionally important qualities of the future teacher, his/her professional consciousness and behavior, and also promote the development of individuality [5].

The main goal of environmental education of future biology teachers is to form an ecological culture of schoolchildren, which cannot be achieved without the use of

the following principles:

- the principle of practical orientation. This principle is responsible for the acquisition of skills in the study of practical environmental work in the course of practice and laboratory work provided by the program and during optional and circle work;
- the principle of continuity and consistency. It is characterized by the constant exchange of knowledge, continuity and sequence of studying environmental education throughout the entire period of study;
- the principle of activity and consciousness. This principle implies that students consciously perform environmental tasks to carry out environmental work, without being reminded by the teacher;
- the principle of nature correspondence. This principle characterizes nature as the basis of child development, aimed at taking into account the multifaceted nature of man, developmental features in terms of age and gender;
- the principle of interdisciplinarity. It ensures the study of nature protection processes that have arisen as a result of human activity in the process of implementing interdisciplinary connections, integration of school disciplines [4].

Since environmental education and upbringing of young people is primarily related to the natural sciences, we have identified the main approaches to the development of environmental education and upbringing:

- natural science - this approach is based on the lack of knowledge about nature, natural relationships and the consequences of human impact on the environment. The solution to the problem is seen in teaching environmental knowledge to as many people as possible through various natural science disciplines: biology, physics, chemistry, geography, etc;
- naturalistic - the main idea can be formulated as "studying nature in nature, not through abstract theoretical knowledge";
- global-biospheric - considers the environmental crisis as a global planetary phenomenon. The way out is seen in people's understanding of the essence of global environmental problems and political solutions that concentrate the efforts of the international community;
- problematic - considers the crisis as a result of the cumulative effect of existing environmental problems: environmental pollution, reduction of biodiversity, depletion of natural resources, etc. It aims to educate people to take responsibility for those around them and to overcome specific problems. The solution to the problem is seen in teaching people specific skills to protect or restore the environment and developing their personal responsibility for their actions;
- value-based - views the environmental crisis as the result of material interests prevailing over spiritual ones. Creating the conditions for people to find their way to reunite with life and the world is one of the tasks of the new philosophical trend of "deep ecology";
- cultural and civilization - considers the problem as a systemic crisis of civilizations, which requires the formation of centers of a new culture. It promotes norms of behavior that cause the least damage to nature (water conservation,

recycling, etc.). It echoes the principles of many religious and philosophical teachings and states that solving environmental problems is impossible without world peace, human rights and social justice [2].

All the above-analyzed approaches are important components of the development of environmental education and upbringing, in which learning takes place through knowledge of subjects such as biology, chemistry, geography, etc.

Conclusions. Environmental education and upbringing of future biology teachers is an important problem of our time, which consists in mastering scientific knowledge about the environment, complex interrelationships in nature, forming knowledge and skills of a research nature, understanding modern environmental problems, forming environmental awareness and culture of the individual.

The main goal of environmental education and upbringing of future biology teachers is to form an ecological outlook based on the unity of scientific and practical knowledge, responsible and positive emotional and value-based attitude to their health, environment, improving the quality of life, and meeting human needs. The problem of the general deterioration of the ecological situation is the insufficient or low level of environmental knowledge of the population. This issue can only be resolved through environmental education and upbringing of the younger generation.

Author contributions. The authors contributed equally.

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