

CHAPTER 3

THEORY AND METHODS OF VOCATIONAL EDUCATION

DEVELOPMENT OF ECOLOGICAL CULTURE IN FUTURE TEACHERS OF BIOLOGY AND ECOLOGY

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Abstract. This paper delves into the crucial role of ecological education in developing the ecological culture among future biology and ecology teachers. Given the pressing challenges of the ecological crisis, this study emphasizes the need for an educational paradigm that not only imparts environmental knowledge but also fosters a deep-seated value system and responsible behaviors towards the environment. The research identifies the core components of ecological culture, which include environmental knowledge, skills, values, and the ability to predict and mitigate the adverse impacts of human activities on nature. The methodology employs a blend of traditional and innovative educational techniques, incorporating discussions, observations, surveys, and the integration of environmental content across the curriculum. The study highlights the structured formation of ecological culture through a five-stage process, ranging from initial orientation to reflective evaluation. Each stage is designed to enhance students' engagement with environmental issues, cultivate a professional and personal commitment to environmental stewardship, and develop competencies that align with the normative documents of higher pedagogical education. The findings underscore the significance of integrating ecological education within the framework of higher education, demonstrating that a systematic approach can effectively cultivate future educators who are well-equipped to promote and embody ecological culture. This integration not only prepares educators to handle environmental challenges professionally but also encourages the adoption of sustainable practices in their personal lives and teaching careers. The paper concludes that establishing a robust ecological culture in educational settings is pivotal for fostering a generation of educators who are proactive in addressing and solving environmental issues.

Keywords: ecological education; ecological culture; biology and ecology teacher; components of ecological culture.

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Introduction. The current ecological crisis, representing a powerful challenge to society, confirms the fact that a person on the path to scientific and technological progress, has only the experience of environmental activities, which did not contribute to its successful adaptation and is characterized by environmental instability. The leading role in this process belongs to the education system, given its proactive character. Recognition of environmental problems as global determines the need for an integrated direction of education on the formation of ecological culture, as one of the highest values. Ecological culture is a complex pedagogical phenomenon, which has a multicomponent structure. Among the most used components of the future teacher training are: content, motivation, operational and activity.

The formation of the ecological culture of the future teacher of the foundation of health contributes to:

- mastering the work experience of professionals in this business; familiarizing with the flow of environmental information in the form of analysis, synthesis, evaluation,
- forecasting of the environmental consequences of human life and drawing up recommendations for solving environmental problems;
- development of general cultural and human competencies provided for by the requirements of normative documents of higher pedagogical education,
- paying attention to the environmental aspects of the content of vocational education of the teacher of health.

A coherent combination in the educational process of specific organizational and pedagogical forms, methods and means provides conditions for the effective formation of ecological knowledge, views, beliefs on the problem of interaction between man and nature, the formation of value orientations of conscious, active and, most importantly, responsible attitude to the problems of the environment and their solution. Thus, the conditions for effective formation of the ecological culture of future teachers in the educational process are provided.

The socio-cultural situation of the twenty-first century sets a benchmark for the education system aimed at harmonizing relations in the "man-society-nature" system, capable of withstanding the worsening environmental situation.

The current ecological crisis, representing a powerful challenge to society, confirms the fact that a person on the way to scientific and technological progress has only the experience of ecological activity that did not contribute to its successful adaptation and is characterized by ecological instability. The leading role in this process belongs to the education system, given its advanced nature [5-6].

Environmental education is becoming the core of modern education and serves as a key to restructuring its modern systems and society as a whole.

Recognition of environmental problems as global determines the need for a comprehensive focus of education on the formation of environmental culture as one of the highest values.

Literature review. The founders of the development of ecological culture of the individual were V. Sukhomlynskyi, I. Suravehina, O. Zakhlebnyi, I. Zverev, who substantiated its theoretical foundations and developed conceptual provisions.

V. Bondarenko, T. Hladiuk, E. Hirusov, I. Zverev, O. Korol, L. Lukianova and others devoted their research to certain aspects of the formation of future teachers' ecological culture.

An analysis of the works of many researchers has shown that almost all scientists point to the main components of environmental culture: a system of environmental knowledge; a system of skills and abilities for the rational use, enrichment and protection of nature; environmental work, a system of environmental values [3, 9-18].

B. Likhachev understands ecological culture as a new formation in a personality that is born and develops under the influence of the motivational, intellectual and emotional spheres of life and materializes in the style of relations with the social and natural environment.

Considering the issue of ecological culture of the individual, I. Zverev and I. Suravehina believe that it is based on an understanding of the laws of living systems and respect for life, and its main indicator is social and individual environmental responsibility for events in nature and human life.

M. Rogozina sees ecological culture as "a new way of connecting people with nature, reconciling them with it on the basis of a deeper knowledge of it."

C. Sovgira determines that the basis of ecological culture is ecological knowledge, which, according to the level of generalization, is divided into local, thematic, subject and philosophical.

Ecological culture is a complex pedagogical phenomenon with a multicomponent structure.

The researchers note the leading role of the teacher in the development of the ecological culture of the individual, which is manifested in a responsible, caring attitude to the environment, as well as in environmentally oriented reflective, evaluative and practical activities in life situations.

Having analyzed the concept of ecological culture in the works of various scholars, we define it as an integrative personality trait that contains relevant ideals and values, norms of behavior, and environmental responsibility. We can conclude that all definitions of environmental culture do not exclude but complement each other.

However, in order for future biology and ecology teachers to fulfill their mission, they themselves must be carriers of ecological culture, individuals of a safe type of behavior characterized by the inability to harm themselves, other people and the environment.

Aims. In this regard, the formation of ecological culture in the future biology and ecology teacher is a main goal of an article that requires a detailed consideration of this process.

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. However, in order for future biology and ecology teachers to fulfill their mission, they themselves must be carriers of ecological culture, individuals of a safe type of behavior characterized by the inability to harm themselves, other people and the environment.

In this regard, the formation of ecological culture in the future biology and ecology teacher is an urgent problem that requires a detailed consideration of this process.

In pedagogy, the ecological culture of a personality is understood as a measure and method of realization and development of the essential forces of a person, ecological thinking in the process of spiritual and material development of nature and maintaining it as a value.

At the level of the educational process, the formation of students' ecological culture is achieved by:

- 1) filling the educational process with environmental content;
- 2) combining classroom organizational forms and innovative, including interactive methods of forming students' environmental culture;
- 3) introducing specific forms and means into extracurricular activities.

The structure of ecological culture includes the following components:

- a system of scientific knowledge about the interaction in the "nature-society-human" system, aimed at understanding the processes and results of interaction - human, society and nature;
- intellectual and practical skills related to studying and assessing the state of the environment, predicting the consequences of human intervention in natural processes, and observing the norms of behavior and activity;
- emotional and value attitude to nature, environment, health, environmental activities to preserve and improve the environment and health [5, 13-18].

In his research, S. A. Lipin identifies three main stages of environmental culture formation:

- a) unconscious imitative behavior (at this stage, activities are equated with imitation or with activities based on the principle "It is necessary", the most important skills and behavioral stereotypes are laid down);
- b) conscious behavior, when behavior is mostly determined by the knowledge gained in the learning process (at this stage, behavior is corrected, stereotypes of behavior in standard situations are formed);
- c) stereotyped behavior (this stage is characterized by the fact that a person acts in accordance with the stereotypes of his/her behavior and established habits of behavior) [2].

The analysis of the theory and practice of forming the ecological culture of future teachers of biology and ecology has shown that the formation of ecological culture in the conditions of higher education requires an organized system, the effectiveness of which is ensured by the availability of an appropriate conceptual and methodological basis, namely

- creation of a unified approach to the formation of ecological culture in the educational space of higher education in the course of various educational activities of students;
- environmental education should be based on a systematic principle;
- the process of formation should be based on a hierarchical system of philosophical categories and laws of cognition;
- students should have a system of environmental value orientations, which is ensured by the implementation of a set of axiological principles (democracy, humanistic orientation, tolerance, self-determination) in the system of purposeful development of the relationship between the inner world of students and the external environment [1].

In our study, we identified the following components of future biology and ecology teachers' ecological culture:

- the motivational component of ecological culture is represented by the system of its motivating forces, needs, aspirations, intentions and life preferences. The basis of the motivational component is professional orientation, personal attitude to the acquisition and implementation of their knowledge, skills and abilities, which is also expressed in the inclination, interest in the profession, desire to succeed;
- the value and worldview component of the ecological culture of specialists is formed by a set of social, psychological, pedagogical, ecological values created by mankind and included in the pedagogical process at the present stage of education development;
- the content and activity component includes philosophical, psychological knowledge, as well as skills and abilities in the organization of environmental activities;
- emotional and volitional component of ecological culture implies the presence of emotional sensitivity of the individual to nature, experience of emotional and volitional attitude to nature, volitional tension in solving socio-ecological problems at the personal level, achieving optimization of relations between man and nature;
- the reflexive component of environmental culture includes a number of students' abilities: self-assessment and self-control of various types of experience (environmental, socio-cultural and diagnostic); transformation of the system of environmental and social knowledge in a certain socio-natural environment; orientation to the quality and level of socio-ecological development of specialists in various fields of activity and prompt response and changes in this process [7].

The analysis of the research allowed us to define the principles on the basis of which the process of environmental training of future teachers is carried out:

- the principle of integrity of the system of training a specialist in a higher education institution, which involves combining the goals and means of training into a single system;
- the principle of selection and adequacy of the information received;
- the principle of interdisciplinary connections and integration of disciplines;
- the principle of individualization, taking into account personal qualities;
- the principle of subjective development and self-development;

- the principle of personalization of pedagogical interaction;
- the principle of reflective management of the process of general and professional development;
- the principle of inclusion in innovative activities, closely related to the principle of unity of the subjective and personal approach;
- the principle of stimulating the processes of success and improvement;
- the principle of subjectification of natural objects;
- the principle of forming opinions, which consists in the formation of a system of ecological ideas of the individual;
- the principle of reliance on methods of contextual and problem-dialogic communication [8].

In the process of forming the environmental culture of future biology and ecology teachers, we distinguish 5 stages:

Stage I is an orientation and familiarization stage. The stage involves the introduction of environmental components into general education disciplines; familiarization with the goals, objectives, content of future professional activity, its place and role in solving environmental problems.

The second stage is motivational. This is the stage of predominantly forming value attitudes towards nature and humans. The general task of this stage is to develop the student's environmental and value orientations.

Stage III - practice-oriented. The objectives of this stage are: to acquire knowledge about the relationship and complementary trends of ecologization and humanization in education and civilization development; to develop the concept of a personality-oriented style of professional activity based on the formation of professional value orientations and knowledge about the mechanisms of personality development.

Stage IV - self-organization - involves comprehension of existing knowledge and experience; use of the acquired knowledge, skills, abilities in practical activities, aimed at creating own models of professional activity with the inclusion of the environmental component; professional formation and self-realization.

Stage V - reflexive - is the stage of the subject's assessment of the productivity of his/her development as a result of professional activity, in solving environmental problems; establishing the reasons for the recorded state of development; assessing personal value, the significance of the problems solved, and the environmental activities carried out. This stage is highlighted as a separate one conditionally, as it permeates all the above stages.

The formation of the ecological culture of the future teacher of biology and ecology is facilitated by:

- mastering the experience of professionals in this field, familiarization with the flow of environmental information in the form of analysis, generalization, evaluation, prediction of the environmental consequences of human activity and making recommendations for solving environmental problems;
- development of general cultural and human competencies stipulated by the requirements of normative documents of higher pedagogical education, paying

attention to the environmental aspects of the content of professional education of teachers of biology and ecology [4];

- development of students' creative activity in the process of solving environmental problems using the whole range of technological techniques.

Conclusions. Thus, the coordinated combination of specific organizational and pedagogical forms, methods and tools in the educational process provides conditions for the effective formation of environmental knowledge, views, beliefs on the problem of human-nature interaction, the formation of value orientations of conscious, active and, most importantly, responsible attitude to environmental problems and their solution. Thus, the conditions for the effective formation of the ecological culture of future teachers of biology and ecology in the educational process are provided.

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