

## CHAPTER 3

# THEORY AND METHODS OF VOCATIONAL EDUCATION

### THEORETICAL PRINCIPLES OF FORMATION OF ECOLOGICAL CULTURE OF FUTURE SPECIALISTS IN HIGHER EDUCATION INSTITUTIONS

**Nataliia Fihol<sup>1</sup>, Petro Dziuba<sup>2</sup>, Marianna Horvat<sup>3</sup>, Oksana Shkvyr<sup>4</sup>,  
Nadiia Ostrovska<sup>5</sup>, Nadiia Bryzhak<sup>6</sup>**

<sup>1</sup>Ph.D. (Pedagogy), Associate Professor, Taras Shevchenko Regional Humanitarian Pedagogical Academy of Kremenets, Kremenets, Ukraine, e-mail: figolnata@ukr.net, ORCID: <https://orcid.org/0000-0003-3206-1281>

<sup>2</sup>Ph.D. (Pedagogy), Associate Professor, National Academy of the State Border Guard Service of Ukraine named after Bohdan Khmelnytskyi, Khmelnytskyi, Ukraine, e-mail: pit76@ukr.net, ORCID: <https://orcid.org/0000-0001-7336-5279>

<sup>3</sup>Ph.D. (Pedagogy), Associate Professor, Mukachevo State University, Mukachevo, Ukraine, e-mail: jmarianna2017@gmail.com, ORCID: <https://orcid.org/0000-0003-2320-9731>

<sup>4</sup>Doctor of Sciences (Pedagogy), Associate Professor, Khmelnytskyi Humanitarian-Pedagogical Academy, Khmelnytskyi, Ukraine, e-mail: pit76@ukr.net, ORCID: <https://orcid.org/0000-0001-7336-5279>

<sup>5</sup>Ph.D. (Pedagogy), Associate Professor, Separated subdivision of NULESU «Berezhany Agrotechnical Institute», Berezhany, Ukraine, e-mail: ostrovskand@gmail.com, ORCID: <https://orcid.org/0000-0002-1802-7282>

<sup>6</sup>Ph.D. (Pedagogy), Associate Professor, Mukachevo State University, Mukachevo, Ukraine, e-mail: n.bruzhak@gmail.com, ORCID: <https://orcid.org/0000-0003-2795-6005>

**Abstract.** *The article considers the issue of formation of ecological culture of future specialists in the process of study in higher education institutions. The urgency of the problem at the present stage of development of society is considered. The problem of greening of education is especially acute today, when hostilities are taking place in Ukraine, the infrastructure of industrial centers is being bombed, chemical industries are being destroyed, and lands are being clogged with explosive shells. Much attention is paid to studying ways to improve the training of future professionals in the field of ecology. Among such ways are: improving programs in academic disciplines by introducing environmental issues into their content. This contributes to better training of specialists with a high level of environmental culture. The incentive for this is to increase the requirements for professional training of future specialists in environmental issues. The concepts of «culture» and «ecological culture» are defined, which are decisive in the research process. It is shown that the state of ecology largely depends on the ecological culture of the individual, which is its integrated property. It consists of a system of knowledge, practical skills, beliefs and mastered norms of interaction with the environment. Three approaches to understanding culture were identified: dynamic-procedural, systemic and axiological. Based on them, the features of ecological culture are considered. It consists of the following elements: a system of knowledge, practical skills, beliefs and mastered norms of interaction with the environment; environmental law; environmental education. Environmental education is determined as a continuous process of education aimed at mastering systematic knowledge about the environment, skills and abilities of environmental protection, and the formation of a general ecological culture.*

*The main principles of environmental education are selected: interdisciplinary approach in the formation of environmental culture, systematic and continuous study of environmental material; the unity of intellectual and emotional-volitional foundations in the activities of students to study and improve the environment, the relationship of global, national and local history of environmental issues in the educational process.*

**Key words:** *future specialists, culture, components of culture, ecological culture, ecological education, functions of ecological education, principles of ecological education.*

**JEL Classification:** I0; I20

**Formulas:** 0; **fig.:** 0; **tabl.:** 0; **bibl.:** 8

**Introduction.** Currently, the deteriorating ecology of the environment is of growing concern. This is indicated in the Concept of Sustainable Development of Ukraine, which presents the reasons for this situation: reckless use of natural resources (excluding the consequences of their use, which can lead to environmental destruction and human disease); low level of ecological knowledge of specialists and insufficient information of the population on the problem of ecology.

There are several ways to overcome these shortcomings. Among them are the following: raising public awareness of environmental issues by lecturing, conducting seminars; raising the level of knowledge on environmental issues of future specialists in various specialties; improvement of programs for future specialists in ecology, which will then be able to raise public awareness of environmental issues, the introduction of new technologies for the disposal of industrial waste, the use of waste-free production. This should be taught to future professionals while studying at a higher education institution.

**Literature review.** The urgency of the study is indicated by the works of scientists, in particular N. Avramenko, V. Hrubinka, M. Drobnokhod, O. Mateyuk, G. Pustovita, V. Yasvin. According to the analysis of the works of scientists (B. Lykhachev, I. Zverev, I. Surovegino, etc.) a more detailed study requires the formation of various components of environmental culture, the characteristics of which are presented in the works of E. Fleshar, N. Pustovita. Scientists understand ecological culture as a set of knowledge, skills, life experience, rules of human coexistence, norms of behavior. The system of formation of components of ecological culture of the future teacher is considered by L. Lukyanova, O. Mateyuk. The works of N. Lysenko, T. Ninova, G. Tarasenko are devoted to the improvement of the content and methods of forming the ecological culture of future teachers. The issue of formation of ecological culture of specialists of technical specialties is considered in the works of L. Bilyk, N. Chornovil.

The researched problem in foreign editions is considered in the works of A. Schweizer, B. Commoner, E. Pestel, A. Pechcha and others.

The problem of increasing knowledge on the implementation of a waste-free manufacturing process was raised in the works of V. Prusak. All the works point out the importance of forming the ecological culture of future specialists and the need for a detailed study of the problem.

**Aims.** The purpose of the article is to study the theoretical foundations of environmental education and culture and ways to increase the level of environmental culture.

**Methods.** Methods used to study the state of research and determine the main directions of further research: analysis, synthesis, modeling. Methods used in order to study the readiness of ecological culture of future specialists: surveys, questionnaires,

testing. Methods of mathematical statistics were used to determine the effectiveness of the study.

**Results.** Based on the analysis of the works of scientists on the formation of environmental culture of future professionals, it was concluded that this issue is relevant for professionals in various fields. This is happening due to the rapid development of society, which involves the introduction of new technologies in production processes, which are not always sufficiently tested, and therefore sometimes harm the environment and, consequently, man. Therefore, the requirements for the training of specialists in ecology in various specialties are increasing.

The research examines ways to increase the level of environmental culture of future professionals. The need to improve curricula by including environmental issues was identified. This contributes to better training of specialists with a high level of environmental knowledge, which is stimulated by increased requirements for the professionalism of environmental professionals, based on modern criteria for assessing the quality of knowledge and readiness for professional activities using environmental knowledge in everyday life.

According to academician B. Likhachev, the ecological culture of a person is «organically connected with the person as a whole». It arises as a new mental education, which is seen as a unity of accordingly developed consciousness and emotional and mental states. The core of this consciousness is a specially oriented mental analytical-synthesizing ability of man, which guarantees scientifically-based inclusion in nature, society, meaning the preservation of their balance [1].

The relevance of the problem is due to legal documents: Law of Ukraine «On Environmental Protection», Law of Ukraine «On Environmental Emergency Zone», the Concept of Environmental Education in Ukraine, approved by the Board of the Ministry of Education and Science of Ukraine N13 / 6-19 from 20.12. 2001 [2; 3].

The issue of development of methodological bases of ecological education and its continuity should be present in the state educational programs of higher education institutions.

Currently, the concept of culture is considered on the basis of methodological approaches. Three approaches to understanding culture were identified. The first approach (dynamic-procedural) takes into account the dynamic nature of culture as a result of human development. The second approach (systematic) reflects the system of shaping the beginnings of activity. The third approach (axiological) is considered as a system of values [4].

A detailed analysis of these approaches provided an opportunity to move from the concept of «culture» to the concept of «ecological culture». The following provisions were used:

- culture is an «ordered system of information transmitted through social channels and encodes the behavioral and cognitive characteristics of social groups, including aspects such as attitudes, knowledge, beliefs, skills, abilities» [5];
- culture is seen as a specific human trait of interaction with the environment;
- culture as the content of civilization reflects its basic traditions [4].

Ecological culture is a part of general educational culture, which influences the degree of solving of ecological problems of mankind. The state of ecology largely depends on the ecological culture of the individual, which is an integrated property of the individual. It consists of a system of knowledge, practical skills, beliefs and mastered norms of interaction with the environment. This is the first element of ecological culture.

The second element of environmental culture is environmental law. Based on it, the interdependence between anthropogenic loads and the negative consequences of such influences is established [6].

The third element is environmental education. Environmental education is a set of the following components: environmental knowledge, environmental thinking, environmental worldview, environmental ethics, environmental culture. Environmental education is «a continuous process of education aimed at mastering systematic knowledge of the environment, skills and abilities of environmental protection, and the formation of a general environmental culture» [7].

Consider in more detail the characteristics of environmental education. The functions of environmental education include:

- organization of harmonious relations between society and nature;
- ability to predict the negative consequences of human activities, production processes;
- management of society's attitude to nature in the process of economic activity [8].

It is determined that the following components should be present in the content of environmental education

- scientific knowledge related to the relationship in the system «man - society»;
- knowledge of appropriate ways of personality in the natural environment;
- experience of practical environmental activities [9].

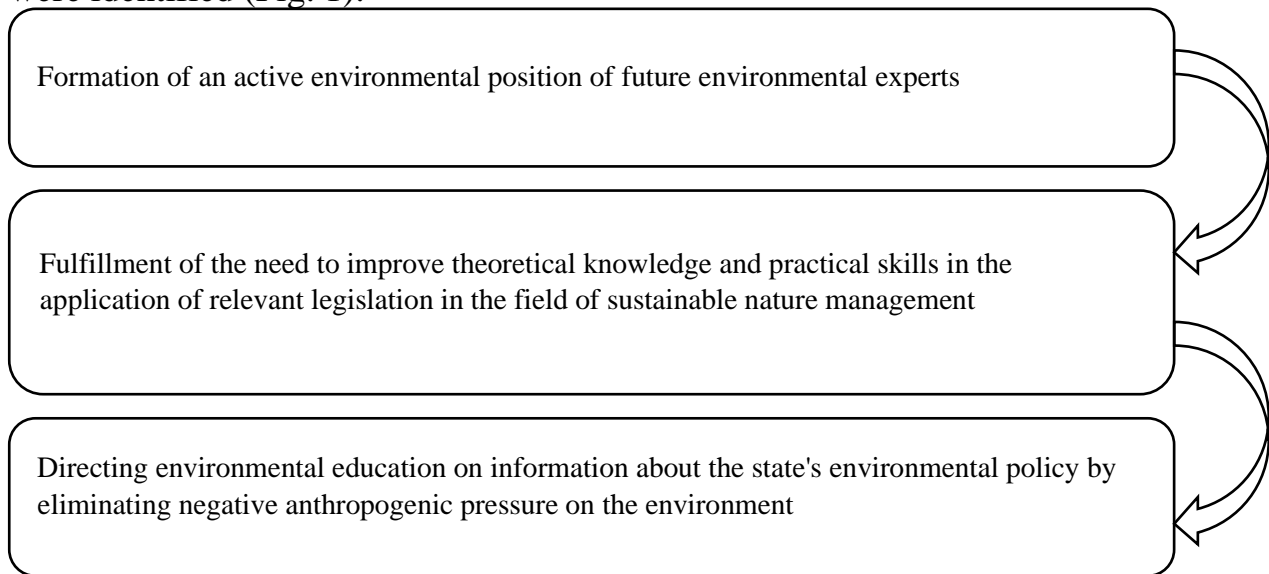
Every education is based on certain principles and approaches. The main principles for environmental education are: scientific, systematic, continuity, complexity, purposefulness, unity of the environment, inseparable connection of its components, interdependence of natural processes, connection of theory with practice.

Among the approaches we define: interdisciplinary, praxeological, axiological, acmeological, professional. These approaches determine the content of environmental education.

Following the principles of didactics and methodological approaches improves the quality of formation of environmental competence of future professionals.

In his works on the problem of ecology M. Kupchak identifies the main components of the system of environmental education and, among which are its formal and informal parts. Different in methodology and forms, they are subject to a common goal - the training of highly qualified professionals who «will skillfully, competently and timely understand, identify and optimally address environmental and socio-economic problems at the national and local levels with the help of scientific knowledge of biosphere development processes» [10].

Based on the analysis of literature sources, the main directions of the impact of environmental education on the environmental consciousness of future professionals were identified (Fig. 1).



**Figure 1. Directions of development of ecological education [10]**

The presented scheme indicates the continuity of the process of environmental education and upbringing.

Other scholars identify three significantly different areas of environmental education. The first direction is defined as ideological. It is a continuation of the educational direction, the foundations of which are laid in the secondary school. This indicates that regardless of the profession chosen by the future specialist, he must have the basics of environmental knowledge, the necessary worldview and rationalist vision of man in the biosphere.

The second direction is the ecological professionalism of the future specialist. It is related to the nature of the future activities of the specialist, his ability to make the most appropriate decisions and be responsible for their results. Such training should be completely different in higher education institutions of different profiles.

The third area of activity is related to the need to train professionals who are ready to show their activities in different situations (i.e. to be professionally creative specialists) [11].

Based on these materials, we concluded that environmental education is the result of mastering the system of environmental knowledge, values and motivations, skills, abilities and experience of cognitive and practical activities in nature protection.

Analysis of literature sources allowed to determine the basic principles of environmental education:

- interdisciplinary approach in the formation of environmental culture;
- systematic and continuous study of environmental material;
- the unity of intellectual and emotional-volitional foundations in the activities of students to study and improve the environment;

- the relationship of global, national and local history disclosure of environmental problems in the educational process.

Scientists define ecological culture «as a relatively independent type of cultural activity that arose at a certain stage of development of society and is an organic part of world culture» [12].

According to B. Likhachev, ecological culture should be considered from different angles: as a result of human activities to transform the natural environment in accordance with physiological and social needs; as a characteristic of the level of ecological consciousness in social representatives, which reflects the attitude to the natural environment as a vital ecological value. Ecological culture is the creative activity of people in relation to the ecological assimilation of the natural environment, in the process of which ecological values are carried out, preserved, distributed and consumed [1].

I. Zverev believes that the concept of «ecological culture» applies to all spheres of material and spiritual life of our society, each person and is expressed in such scientific and practical activities that preserve and enrich the environment, create favorable conditions for human life, and its comprehensive development and improvement [13].

Based on the above characteristics, it was found that the most important indicator of environmental culture is the recognition of multifaceted material, ethical, aesthetic and cognitive value of nature [14].

Summarizing the presentation in the pedagogical literature it is shown that the ecological culture of the individual is a holistic system of interrelated elements: environmental knowledge, values, regulations, practice; environmental thinking, which establishes cause-and-effect, prognostic and other types of relationships, which contributes to the understanding of the causes and ways to solve environmental problems. Manifestation of ecological culture of the individual is environmentally responsible activities.

**Discussion.** At the beginning of the study, we aimed to determine the state of motivation of students to participate in solving environmental problems.

A survey of students and cadets in whose teachers are co-authors of the article was conducted. Total number of participants 126.

Questionary.

1. Do you consider it appropriate to participate in environmental protection?
2. What is your expediency of inclusion of questions of ecological maintenance in curricula of profile disciplines.
3. What environmental issues concern you the most?
4. Is there a need to introduce special seminars on ecology in the educational process?
5. What topics do you want to study further?
6. What forms of classes are most interesting for you?
7. What is your attitude to self-study of environmental issues?
8. What ways to improve the quality of training do you think are necessary?

9. What preventive work on environmental issues will you be able to carry out during your lifetime?

10. What is your opinion on the readiness of specialists of various profiles to solve the problems of the environmental plan?

According to the results of the survey, we concluded that:

Environmental issues concern all respondents.

73.01% of participants will take part in solving environmental problems; 15.80% - undecided; 11.19 do not see themselves in the role of protector of nature.

The most worrying problems are: contamination with industrial waste, insufficient number of waste processing plants, lack of clear waste sorting, small number of non-waste productions, insufficient level of ecological culture of the population.

There is a need to introduce special seminars on environmental issues in the educational process.

The most interesting forms of classes are lectures-talks, excursions, writing essays, and the development of computer games.

65.07% of respondents chose an independent form of work, 17.46% under the guidance of a teacher, and 17.46% do not intend to work independently.

According to the respondents, expedient and effective ways to improve the readiness for environmental work with the population should be: increasing the number of hours to study environmental issues, the introduction of information and communication technologies in the educational process, and field trips.

During our lives we will be able to hold preventive talks, set our own example of environmental protection.

Specialists of various profiles are not ready enough to preserve the environment.

These results made it possible to determine the need to increase the level of readiness of specialists in various fields to solve environmental problems.

**Conclusions.** Analysis of ways to introduce environmental issues in the curriculum of professional disciplines, webinars, theoretical material on environmental issues showed an insufficient level of environmental culture of specialists in various fields. Therefore, there is a need to improve the learning process. Further research will focus on identifying and identifying components of environmental culture: design, gnostic, communicative.

**Author contributions.** The authors contributed equally.

**Disclosure statement.** The authors do not have any conflict of interest.

#### References:

1. Lihachev B.T. (1993) Ekologija lichnosti [Ecology of personality] // Pedagogika.- 1993.- №2.-. P.19-23. [in Russian].
2. Koncepciya ekolohichnoyi osvity Ukrayiny. [The concept of environmental education in Ukraine] Dyrektor shkoly. 2002. №16 (208). P. 20–29. [in Ukrainian].
3. Zakon Ukrayiny «Pro osnovni zasady (stratehiyu) derzhavnoyi ekolohichnoyi polityky Ukrayiny na period do 2020 roku» vid 21 hrudnya 2010. [Law of Ukraine "On Basic Principles (Strategy) of the State Environmental Policy of Ukraine until 2020" of December 21, 2010] URL: <http://zakon0.rada.gov.ua/laws/show/2818-17>. [in Ukrainian].
4. Mateyuk O. P. Formuvannya ekolohichnoyi kul'tury osobystosti: pedahohichni, psyxolohichni ta filosofsk'i zasady [Formation of ecological culture of personality: pedagogical, psychological and philosophical principles] // Duxovnist' osobystosti: metodolohiya, teoriya i praktyka. Zbirnyk naukovyx prac'.

- Vypusk 1(14) / Za red. H.P. Shevchenko. – Luhans'k: Vyd-vo Sxidnoukr. nac. un-tu im. V. Dalya, 2006. – P. 153-161. [in Ukrainian].
5. Honcharenko S. U. Ukrayins'kyj pedahohichnyj slovnyk [Ukrainian pedagogical dictionary] / Semen Ustynovych Honcharenko. – K.: Lybid', 1997. – 374 p. [in Ukrainian].
  6. Zavorodnya V. M. Ekolohichne pravo [Environmental law]: navch.-metod. posib. dlya samostijnoho vyvchennya dyscypliny. Sumy: DVNZ «UABS NBU», 2010. 118 p. [in Ukrainian].
  7. Luk'yanova L. B. Filosofs'kyj pidxid do vyvchennya ekolohiyi [Philosophical approach to the study of ecology]. Pedahohika i psixolohiya prof. osvity. 2008. № 1. S. 27–37. [in Ukrainian].
  8. Rudyshyn S. D. Filosofs'ki osnovy ekolohichnoyi osvity: henezys, suchasni tendencyi rozvytku [Philosophical foundations of environmental education: genesis, current trends]. URL: <http://www.enpuir.npu.edu.ua/bitstream/123456789/12830/1/Rudyshin.pdf>. [in Ukrainian].
  9. Stefankiv O. M., Maksymovych O. M. Racionalizaciya pryrodo-korystuvannya v APK ta formuvannya ekolohichnoyi svidomosti naselennya [Rationalization of nature management in the agro-industrial complex and formation of ecological consciousness of the population]: monohrafiya. Ivano-Frankivs'k: Simyk, 2012. 180 p. [in Ukrainian].
  10. Kupchak M. Ya., Xarchuk A. I. Ekoloho-pravovi aspekty formuvannya osobystosti faxivciv systemy MNS Ukrayiny. Humanitarni aspekty formuvannya osobystosti [Ecological and legal aspects of personality formation of specialists of the system of the Ministry for Emergencies of Ukraine. Humanitarian aspects of personality formation]: zb. stat. VI Vseukr. nauk. konf. (L'viv, 27 kvit. 2012 r.). L'viv: L'vivs'kyj derzhavnyj universytet bezpeky zhyttyediyal'nosti. P. 372–378. [in Ukrainian].
  11. Brovdij V.M., Vadzyuk N.V., Honchar A.D. Oxorona pryrody [Nature protection]: Posibnyk dlya uchniv starshyx klasiv zahal'noosvitnix shkil, licyiv, himnazij, koledzhiv. –K.: Heneza, 1997. – P. 142-152. [in Ukrainian].
  12. Voronina L.M. Ekolohichne vixovannya: suchasni aspekty [Environmental education: modern aspects] // Shkil'nyj svit. – 2002. – № 38. – S. 3-4. [in Ukrainian].
  13. Zverev I.D. Metodologicheskie osnovy principov i uslovij realizacii jekologicheskogo obrazovanija [Methodological bases of principles and conditions of realization of ecological education] // Pedagogicheskie principy i uslovija jekologicheskogo obrazovanija: Sb. nauch. tr. – M.: NISIMO, 1983. – 98 p. [in Russian].
  14. Haluzyns'kyj V.M., Yevtux M.B. Osnovy pedahohiky ta psixolohiyi vyshhoyi shkoly v Ukrayini [Fundamentals of pedagogy and psychology of higher education in Ukraine]. – K.: Intel, 1995. –168 p. [in Ukrainian].

**Received: May 28, 2022**  
**Approved: June 29, 2022**