

Ecological culture issues in the context of environmental education

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Abstract. The task of students' ecological culture formation and finding effective ways to develop persons' liable attitude to the ecological issues and eco-friendly processes is becoming more urgent in modern conditions. The article is aimed at ecopsychological study of person's ecological culture components in the process of professional becoming. The research tasks are: to make a theoretical analysis of ecological culture issues in the context of environmental education; to conduct ecopsychological study of ecological culture components; to develop a methodological recommendations dealing with given problems. To evaluate the main components of ecological culture, the methodology for studying environmental consciousness was used, proposed by scientists V.I. Panov, M.O. Mdivani, E.V. Lidskaya and Sh.R. Khisambeev (subtests "Assessment of environmental threats", "Environmental responsibility" and "Unity with nature" and "Situations"). The value-normative method of G.E. Zalessky as a way of involving subjects in life situations by systematically changing the conditions of the same task was applied. The study provides recommendations for developing ecological culture. In conclusion, methods of environmental education and eco-psychological interaction are described.

1 Introduction

The concept of sustainable development promotes the unification of all spheres of human activity - environmental, economic, social - to protect the world from the environmental crisis. As people are "experiencing a dangerous decline in nature and humans are causing it. We are using the equivalent of 1.6 Earths to maintain our current way of life and ecosystems cannot keep up with our demands" [1, p. 1]. "The environmental problem of civilization at the present stage of its development on Earth is due to the realization that the technological capabilities of humanity have become comparable to the global processes of the planet» [2, p. 379]. The environmental crisis is currently considered as an ideological one, as a crucial point in human consciousness and ecological culture. Preventing and overcoming the environmental crisis is impossible without changing man's attitude towards the natural world [3]. "Nature loss has far-reaching consequences. Damaged ecosystems exacerbate climate change, undermine food security and put people and communities at risk" [1, p. 1]. There is a following problem: What do people need to do to halt and reverse nature loss?

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Solving environmental problems of any scale requires restructuring the current dominant anthropocentric type of environmental culture of people into an ecocentric one. It may be possible by means of environmental education [4].

Environmental education is aimed at developing environmental culture and consciousness, a system of practical knowledge and skills, value orientations.

The environmental education system performs a key pedagogical function: it contributes to the formation of students' environmental consciousness.

The attitude towards the surrounding nature is formed in the process of interaction between the emotional and intellectual spheres of people's consciousness. A psychological phenomenon, the formation of which can help overcome the environmental crisis, is environmental culture. Its structure includes certain components: cognitive (evaluative); emotional-volitional component (ecological (nature-centric) consciousness); behavioral.

The psychological factor in the environmental culture formation makes it possible to create a unique object of problematic interaction at the level of knowledge to adjust the model of behavior in relation to nature. "Ecopsychology is an interdisciplinary and transdisciplinary field that focuses on the synthesis of ecology and psychology and the promotion of sustainable development" [5, p. 4]. This sphere of science differs from psychology. Ecopsychology focuses on the research of the emotional connection between the Earth and humans.

Numerous publications show the particular importance of environmental education today. The problem of the formation of ecological culture and its components has been studied quite well in modern domestic pedagogical literature. We take into account the position of V.L. Benin, that "the cultural approach actualizes anthropological problems of modern pedagogy, posed by life and requiring decisions..." [6, p. 143].

The methodological ecological culture concept was formulated by E.S. Markaryan. "This is a field of interaction between the material and the spiritual, nature and man" [7, p. 100].

One should define the term "ecological culture" as an integral part of the general culture by V.I. Vernadsky, S.N. Glazachev, A.V. Gagarin, G.P. Shchedrovitsky. So, V.I. Vernadsky states that a man is a part of nature that appeared in the process of evolution of the biosphere. Man is the only biological species that consciously protects nature. Vernadsky's concept about noosphere is "of particular relevance, which can serve as the basis for fundamental research into environmental problems and the practical search for their resolution" [8, p. 16]. Understanding the patterns of development of the biosphere is the key to reasonable environmental management.

S.N. Glazachev, A.V. Gagarin present the relevance of acmeological study of ecological culture concept. "Ecological culture is characterized as a form of thinking, self-determination, self-attitude, self-correction, arising from the most general, essential idea of an extremely non-random response to the "ecological situation", leading to a threat to the reproduction of life..." [9, p. 23].

G.P. Shchedrovitsky says that the extensive growth strategy that has become so familiar can no longer satisfy the environmentally oriented public consciousness. We agree that "in order to find the underlying problems and highlight the main issues, we need new concepts and ideas on which people can rely..." [10, p. 13].

"In recent decades, the scope of anthropogenic and technogenic influence on the environment has reached such proportions that the entire globe, and life itself on Earth, are at risk.... Environmental issues have moved up to one of the first places on the list of priority national problems..." [10, p. 33].

In order to reach the problems and outline the necessary ideas in the right aspect, it is necessary to outline the boundaries of the situation itself as a problematic environmental situation. This means that one should understand such concept as ecological culture and the ways of its forming.

Scientists proved that persons' development, which encompassed aspects such as health, standard of living, education, and general well-being, was "intrinsically linked to environmental sustainability" [11, p. 108296]. J.J. Fitzpatrick, E.P. Byrne state that "ecological economics education contributes to sustainability informed engineers" [12, p. 53]. S. McGrath admitted some of the roles that education could and needed "to play in supporting "the great socio-ecological transition", with particular emphasis on adult and vocational education and training" [13, p. 126]. Y. Juanjuan, P. Wei say that it is essential to know the intrinsic law of "ecosystems and upholding the system engineering thinking to coordinate the two basic points of ecological and economic development" [14, p. 1]. L.Ping, V. W. Vongkulluksn, K. Liu, C. Liu proposed to use ecological theory, which "investigates the influence of country, school, classroom, and teacher factors on student-centered teaching" [15, p. 102487]. It is recognized as a best-practice instructional method.

Studying a trade-off between human development and environmental quality makes it clear "that current needs are met without compromising the ability of future generations to meet their own needs" [11, p. 108296].

A comprehensive overview of the methodological foundations of the approaches to the key ecology issues showed that "the conceptual foundations of environmental education in modern conditions should be principles of subjectivity, ideas of natural and cultural conformity of education..." [16, p. 94].

The essence of 'ecological culture' concept is considered as "an organic unity of ecologically developed consciousness, emotional and mental states and scientifically based environmental and practical activities" [16, p. 90]. Ecological culture is known to be a "specific type of culture, characterized by the level of relations between society, man and nature in the process of creating material and spiritual values, the degree of responsibility of society and individuals for preserving the sustainability of the biosphere..." [16, p. 90].

"Ecological culture" concept can be cdescribed as a person's responsibility for nature, conscious participation in environmental life, the ability to control oneself and one's behavior in order to protect ecosystems, commitment to environmental values, self-regulation in the environment. Ecological culture can be recognized as an actual property of the individual, but as a phenomenon becoming and developing, as a certain ideal, the acme of personal growth in modern environmental conditions. It is a man who can make it possible to master such qualities as ecological culture, responsibility and consciousness [17]. The great role in this process is performed by university teachers as they are able to learn future specialists to decide professional problems in terms of the environmental crisis. "Such training should be aimed, first of all, at students' understanding of the role of people's worldview, culture, competence in the prevention of local and global environmental problems" [18, p. 09011].

Currently, it is advisable to use technologies that include methods of eco-psychological interaction with the environment. This is undoubtedly impossible without knowledge of the laws of perception of ecology. The formation of a person mastering ecological culture components can be considered as a result of environmental education.

The object of the study is the phenomenon of students' ecological culture.

The purpose of the study is to describe the role of ecopsychological study in students' ecological culture components forming. The research objectives are: to conduct a theoretical analysis of the problem of environmental culture in the context of environmental education; to conduct ecopsychological study of ecological culture components; to develop a methodological recommendations dealing with given issues.

2 Methodology

The study was conducted during 2023-2024 years at the Polytechnical Institute of Sevastopol State University (SevSU) in several stages. The development of the problem in the scientific

literature was studied at the theoretical-diagnostic stage; pedagogical experience is summarized; an experiment was conducted, as a result of which initial data on the understanding of environmental culture were obtained, the results of students' attitudes towards environmental pollution and its consequences were studied. 60 respondents took part in the experiment. To diagnose the main components of environmental culture, we used the methodology for studying environmental consciousness, proposed by scientists V.I. Panov, M.O. Mdivani, E.V. Lidskaya and S.R. Khisambayev (subtests "Assessment of environmental threats", "Environmental responsibility", "Assessment of environmental threats", "Unity with nature" and "Situations"), the value-normative method of G.E. Zalesky as a way of involving subjects in life situations by systematically changing the conditions of the same task.

The theoretical basis for studying environmental culture in our paper was the work of scientists V.L. Benin, V.I. Vernadsky, S.N. Glazachev, A.V. Gagari, G.P. Shchedrovitsky. Experimental base: the study was conducted at Sevastopol State University (SevSU). The study involved students of 1-3 years of training "Technosphere safety".

The collection of diagnostic data was carried out by questioning students using ecopsychological research methods, the starting point for which is the idea that the mental development, learning, student's behavior and their mental health are connected with the environment.

3 Results and discussion

In the interests of clean technologies application, every specialist has to demonstrate environmental literacy. For example, they have to understand that "the need to coordinate various infrastructures within the extractive industries with the involvement of broader economic mechanisms..." [10, p. 23].

To determine the components of environmental responsibility, we used the "Environmental Responsibility" scale from the Questionnaire developed by employees of the laboratory of ecopsychology of development of Psychological Institute in Russian Academy of Education under the leadership of V.I. Panov [19]. The following components of environmental responsibility of a university student were identified:

- cognitive (evaluative) component (the development of environmental literacy and the formation of personal experience of unity with nature and a subjective attitude towards nature, knowledge about environmental changes, the consequences of environmental pollution);

- emotional-volitional one (ecological consciousness: emotional attitude towards nature, people and oneself, the ability to control oneself and one's behavior in order to preserve natural resources and protect ecosystems, initiative in the field of environmental protection);

- behavioral component (self-regulation, activity based on environmental conscious).

The effective tests were used for ecopsychological research of the ecological culture indicators:

- 1) a methodology proposed by scientists V.I. Panov, M.O. Mdivani, E.V. Lidskaya and S.R. Khisambayev (subtests "Assessment of environmental threats" and "Environmental responsibility") was used to estimate the cognitive component.

The subtests "Assessment of Environmental Threats" and "Environmental Responsibility" provided an evaluation of the positive influence of nature on humans; the negative impact of nature on humans; the positive impact of humans on nature; the negative impact of humans on nature.

- 2) to study the emotional-volitional component, we used the methodology for studying environmental consciousness, proposed by scientists V.I. Panov, M.O. Mdivani, E.V. Lidskaya and S.R. Khisambayev (subtest "Unity with Nature") [19]. This technique provides an assessment of students' consciousness indicators [19]

3) for diagnosing the behavioral component, the technique of V.I. Panov, M.O. Mdivani, E.V. Lidskaya and Sh.R. Khisambayev (subtest “Situations”) [19], which evaluates the degree of preference in a conflict situation: for the technogenic environment; social environment or natural environment.

Value-normative method G.E. Zalessky as “a method of involving subjects in life situations by systematically changing the conditions of the same task” [19, p. 30] is represented by value problem situations. To carry out diagnostics, we have created situational tasks in which environmental issues are related to the future professional activities of student and teachers.

Purposeful step-by-step work on the formation of environmental responsibility in the educational process has a positive effect on all its components (knowledge, character formation, worldview, culture) and the level of health of students. In general, this will contribute to increasing the efficiency of student’s learning, improving their livelihoods and future professional activities.

The following stages of our research work are: the initial diagnostics; the formative one; final assessments.

The technologies of the ecological culture development are based “on methods of environmental education and eco-psychological interaction in terms of the process of forming future engineers’ ecological culture:

educational (development of environmental literacy), practical (formation of personal experience in practical activities to protect the environment)” [2, p. 379];

methods of eco-psychological interaction: (personal experience formation of unity with nature).

Environmental literacy as a component of environmental responsibility presupposes not only the possession of environmental information and knowledge about the impact of natural disasters on our health. .

We consider the implementation of project activities, which take place in stages, as an effective form of developing personal experience in practical activities to protect the environment: 1. Selecting a topic. 2. Development and protection of the project. 3. Summing up the project. In general, design and research activities act as a means of developing students’ ecological culture.

It is advisable to use developmental ecopsychology methods to form a personal experience of unity with nature and a subjective attitude towards nature. It is necessary to explain to students the differences in the relationships “individual — educational environment”, “person — environment (natural, social)”, “individual — professional environment”.

An initial diagnosis of the formation of the components of ecological culture was carried out at the preparatory stage.

After the formative stage, which involved the implementation of developing technologies, the final assessments were carried out.

Estimating the cognitive (evaluative) component.

The subtest “Assessment of environmental threats” is based on “a two-dimensional model of interaction between man and nature, where the impact of man on nature and nature on man are represented in the mind as two independent factors” [19].

The “Environmental Responsibility” subtest diagnoses students’ environmental consciousness and is based “on the respondent’s assessment of environmental measures that were formulated with the help of existing environmental legislation and well-known initiatives of the environmental community” [19].

The results of the subtests “Assessment of environmental threats” and “Environmental responsibility” of the initial and final stages are presented in figure 1.

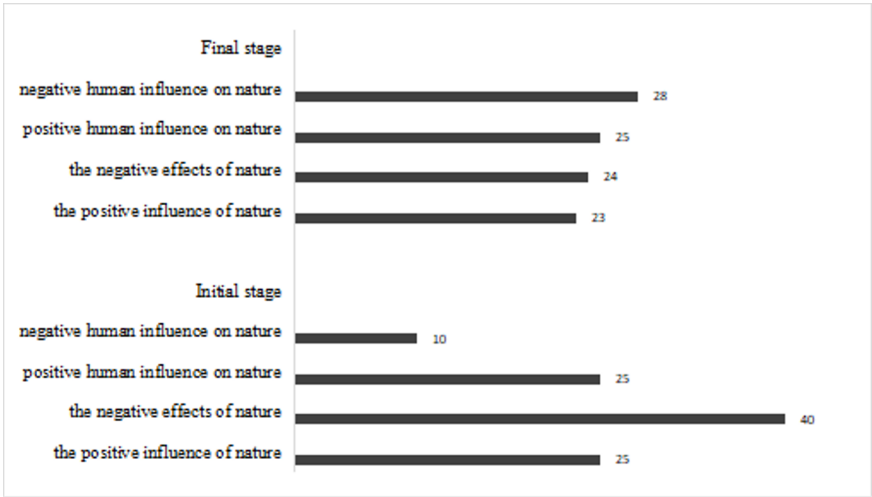


Fig. 1. Diagnosis of the cognitive component assessment (in%)

As the data show, at the initial stage, students had insufficient knowledge about the negative impact of humans on nature. It required work to develop knowledge about environmental problems, technosphere safety and the role of humans in the ecosystem.

1. The study of the emotional-volitional component is based on “Unity with Nature” subtest, the results of which are presented in figure 2.

2.

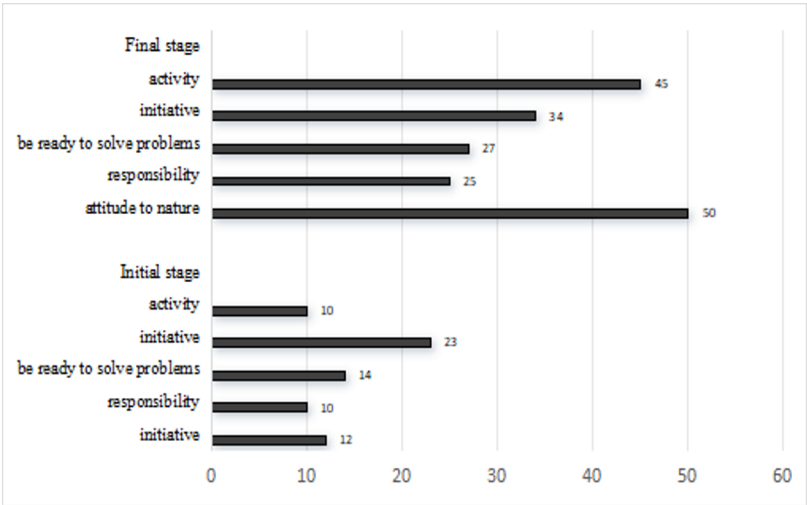


Fig. 2. The emotional-volitional component (in %)

The results of this diagnosis demonstrate the immaturity of the indicators of the emotional-volitional component (only 10-14% of respondents feel themselves to be part of nature, and at the final stage the results are much higher (25-50%).

3. The behavioral component assessments are based on the “Situations” subtest, which comprises two indicators: the choice of behavior in a condition of conflict between personal and environmental motivations and one between different environments (natural and social). The preference in a conflict situation was researched:

- 1) for the technogenic environment;
- 2) for the social environment;

3) for the natural environment.

Methodology G.E. Zalesky as “a method of involving subjects in life situations by systematically changing the conditions of the same task” [20, p. 22] is represented by value problem situations that “require the inclusion of personal mechanisms and systems of personal values in their solution” [20, p. 46].

The conflict is determined by the difference in values that students rely on when making a reasonable approach to an answer. Respondents assessed situations and made “a decision to choose a method of behavior in given conditions...” [20, p. 47].

Thus, this technique makes it possible to analyze students’ activity. The results of the “Situations” subtest of the initial and final stages are presented in figure 3.



Fig. 3. Diagnostics of the behavioral component (in%)

The results of the experiment show that at the initial stage, respondents, when choosing behavior in a situation of conflict between different environments, preferred the social and technogenic environment, and at the final stage - the natural environment.

The effective technologies which are based on methods of environmental education and eco-psychological interaction in the educational process provide qualitative results in the process of environmental literacy development. It can contribute to increasing the efficiency of students’ learning, improving their future professional activities.

The use of methods of environmental education and eco-psychological interaction ensured the formation of the following components of students’ ecological culture: cognitive (evaluative); emotional-volitional component (ecological (nature-centric) consciousness); behavioral component [21].

We characterized ecological culture as conscious interaction of people with the environment, participation in ecological life, support for environmental changes, the ability to control one’s behavior in order to preserve natural resources and protect ecosystems, high initiative in the field of nature conservation, conditional, commitment to environmental values, self-reflection and self-regulation in the environment, the implementation of the choice of strategies and tactics of individual behavior.

The acmeological conditions of personal and professional development of a specialist with ecological culture are:

1. A development of a person’s readiness to respect the environment by means of their knowledge, “ideas and skills in professional management activities, and which characterizes the features of an environmentally-oriented worldview, behavior and activity of the

individual in interaction with nature. And in this case we are talking about the professional-ecological culture of the individual” [9, p. 20].

2. To provide project activity by means of organizing competitions on the most useful solution of any ecological problem.

4 Conclusion

As can be seen from the data we obtained during the experiment, the level of ecological culture of students-future engineers can be determined based on the interaction of the three most important components – cognitive (evaluative); emotional-volitional and behavioral. The results of the experiment indicate that students at Sevastopol University have a high level of ecological culture that has increased significantly as a result of the implementation of a set of activities, as well as design and research activities.

Work in this direction should be comprehensive and begin with the first year of all areas of training. Not only knowledge about ecology and the environment is important, but also personal experience of unity with nature and a subjective attitude towards nature.

The following recommendations can be listed for the development of ecological culture: methods of environmental education: educational (development of environmental literacy), practical (development of personal experience in practical activities to protect the environment); methods of eco-psychological interaction: (formation of personal experience of unity with nature and subjective attitude towards nature).

Analysis of theoretical sources on the research topic allowed to focus on the following points:

1. Future specialist must demonstrate environmental literacy, on which environmental protection depends in the interests of environmentally sound development.

The ego-psychological aspect of the process of developing students' ecological culture makes it possible to create a unique object of problematic interaction at the level of knowledge to adjust the model of behavior in relation to nature and the environment.

2. Ecological culture is determined as an ability to accept, recognize and evaluate contradictions and difficulties, adequately resolving them. It manifests itself in a sense of readiness to act, self-determination and orientation through a revaluation of the value system.

3. The implementation of methods of environmental education and eco-psychological interaction ensured the formation of the following components of students' ecological culture: cognitive (evaluative); emotional-volitional component (ecological (nature-centric) consciousness); behavioral component.

4. The practical potential of this study as a prospect for further study may be in the possibility of developing an empirical model of psychological support for students in order to form an ecological culture and the consciousness of future engineers.

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