

## FORMATION OF ENVIRONMENTAL COMPETENCE OF STUDENTS IN ADDITIONAL EDUCATION

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Abstract: The article considers the substantive and procedural characteristics of environmental competence; substantiates the features of its development in students through the implementation of environmental-oriented measures in additional education. The authors present a generalization of research on environmental competence, on the basis of which the knowledge, activity and motivational-value components of its structure are identified. The result of the study was the presented humanitarian model of environmental education in understanding the ecological competence problems of students in additional education, demonstrating the closest possible result to a scientifically based idea of the object and the process of formation of environmental competence of students in additional education.

Keywords: competence, environmental competence, additional education, students, humanitarian model, knowledge component, activity component, motivational and value component.

### 1 Introduction

In accordance with the basic law of the country - the Constitution of the Russian Federation (2020), special attention is required to implement the principle of equivalence of society, economy, ecology and culture, based on the idea of the value of human life and safety in all its environments (natural, social, man-made, cultural, educational, etc.). To achieve these prognostic goals, as noted in the Environmental Doctrine of the Russian Federation, approved by the decree of the Government of the Russian Federation, the Strategy of Environmental Safety of Russia for the period up to 2025 (approved by Decree of the President of the Russian Federation No. 176 dated 04/19/2017) (2017), it is necessary to rely on the age and psychological and pedagogical characteristics of various ecologically educated categories of the population.

Today, environmental education is a qualitatively new type of education, as it reflects the degree of interaction between society and the natural environment, which is expressed in a person's willingness to use environmental knowledge in practical activities. Despite the extensive experience in Russia in this field (Kondrateva & Ulanova, 2014; Yakunchev & Semenova, 2021), the goal in environmental education is not sufficiently understood didactically and the result is not always measurable. This is seen at various conferences, forums, meetings by professionals and the public (Problems of Formation of Ecological Thinking in Modern Society, 2014; Ecology of the Big City, 2021).

The most important mechanism for the implementation of environmental education is the use of a competence-based approach focused on the formation of individual competencies of students, their personal qualities associated with the development of the cultural experience of mankind and implemented in the field of public activity.

The content of environmental competence of students requires knowledge and activity components in the environmental field. This is the reason for the need to form environmental competence that meets the needs of the time and enables us to consider additional education as a tool that ensures the process of ecological formation of students.

### 2 Literature Review

The desire to ensure the well-being and prosperity of the native country, based on the responsibility of people for their Homeland to contemporary and future generations, has identified ecology as one of the priorities of the country's development. What are the meanings of environmental education in the context of the formation of human environmental competence?

A large number of modern studies have been devoted to the use of the competence approach, the formation of students' competencies (Buyanova et al., 2019; Chiranova et al., 2020; Kurkina et al., 2020; Gorshenina et al., 2017; Kobozeva, 2013, 2017; Parshina, 2008; Pisareva & Tryapitsyna, 2019; Tatyana & Ozerov, 2016; Shukshina et al., 2015).

Yadov (2003) connects the meaningful functional of the phenomenon of competence with integrative-personal qualities directly connected with the processes of self-realization and self-actualization of personality in society. The properties of competence are manifested in activity, in organic unity with human values, provided personal interest.

The works of Chopenko (2019), Sharonova (2006), Yakunchev & Semenova (2021) are devoted to the problems of ecological development of personality in the formative space of competence education. The authors consider environmental education as a process and means of forming environmental competence, and environmental competence as a result of environmental education.

Moiseev (1999) actualizes the indissoluble connection of the man with the natural environment, promoting the idea of a common earthly home as the most important condition for the education of environmental responsibility and the importance of caring for the needs and preservation of nature in the younger generation.

Moiseeva & Nikitina (2011), defining environmental competence, imply a set of knowledge and activity components in this area, the ability to see and solve environmental problems based on the proposal and justification of hypotheses, set goals and plan eco-centric activities, collect and analyze the necessary information, choose the most optimal methods of preserving ecological balance; the ability to apply this knowledge and skills in specific activities.

According to Ermakov (2009), ecological competence is a conscious ability, readiness for independent ecological activity, experience of this activity aimed at preserving and sustainable reproduction of life, at practical improvement of the state of the habitat in the process of identifying, solving and preventing environmental problems

Alekseev (2006) interprets the concept of "environmental competence" as a systemic integrative quality of individuality, characterizing the ability to solve problems and tasks of different levels arising in life situations and professional activities, based on formed values and motives, knowledge, educational and life experience, individual characteristics, inclinations, needs.

Ryabov (2012) understands environmental competence as a conscious ability and readiness for productive environmental activities related to improving the state of the environment and preventing the occurrence of environmental problems.

The system of additional education of children, which activities are associated with the comprehensive satisfaction of the spiritual, moral, cultural and cognitive needs of students, the creation of conditions for self-realization, self-determination and self-actualization of students in the eco-centered environment of modern society (Kondrateva, 2016; Kondrateva & Shcheredina, 2019; Yakunchev & Semenova, 2020), is of significant importance in the formation of environmental competence of the

individual. However, the problem of the formation of environmental competence of students in additional education has not been fully reflected in the scientific literature.

### 3 Research Methodological Framework

The purpose of the study is to consider the content-procedural characteristics of the formation of environmental competence of students in additional education by means of humanitarian technologies of music and decorative and applied arts.

In the course of the study, the following tasks were solved:

1. to clarify the interpretation of the concept of "environmental competence";
2. to substantiate the humanitarian model of the formation of environmental competence of students in additional education.

In the course of the research, theoretical methods were used - analysis of scientific literature, generalization of pedagogical experience.

### 4 Results and Discussion

The analysis of sources has shown the multidimensional and ambiguous nature of the concept of "environmental competence". Moiseeva & Nikitina (2011) identify a set of knowledge and activity components in it, Alekseev (2006) emphasizes the importance of formed knowledge, motives, values and life experience. Ryabov (2012) focuses on readiness for productive environmental activities. Within the framework of the study, the ecological competence of students in additional education is considered as a result-oriented educational process, expressed in the willingness and ability to accumulate positive moral and value experience of interaction with nature environment; to reasonable and safe behavior in nature, the ability to evaluate their own behavior and the attitude of other people to nature; awareness of the need for a nature-like attitude to nature.

The elements of the knowledge component are theoretical knowledge of the basics of ecology, nature management, nature protection; principles of organization and functioning of ecosystems; the ability to predict and solve environmental problems. Activity component: practical participation in improving the state of the environment in various types of environmental activities and self-realization of students in it; creation of safe living conditions for the preservation of the natural environment and assistance in solving environmental problems. The motivational and value component includes a sustained interest in the problems of interaction between society and nature, environmental responsibility and duty to protect nature; conviction of the need for careful attitude to the natural world and readiness for practical interaction of the student in improving the state of the environment.

Thus, environmental competence in the study is understood as the relationship between the processes and conditions that ensure the development of environmental culture by students through various types of environmental activities.

The humanitarian model of the formation of environmental competence of students in additional education reflects the meaningful characteristics of familiarization with environmental responsibility and duty to protect nature, the process of formation of ecological consciousness, the formation of ecological thinking and environmental values based on knowledge about the diversity of folk traditions associated with nature; the development of interest in the natural environment, the education of an emotional-value attitude to the surrounding nature and eco-oriented activities in it, taking into account the age of students, ensuring a change in knowledge, activity and motivational-value components and levels of competence formation.

The *purpose* of modeling is aimed at creating the closest possible result to a scientifically based idea of the object and the process of forming the environmental competence of students in additional education.

When designing the model, we rested on defining the purpose, modeling tasks; collecting and systematizing information related to the tasks; identifying the main factors affecting the change in environmental competence of students; building a model taking into account specific tasks.

When constructing a model for the formation of environmental competence of students in additional education, regulatory legal grounds were taken into account; modern approaches to the organization of extracurricular activities of students, highlighted in the state standard of additional education; personal needs for development and self-improvement, in the interests of environmental activities, in expanding knowledge about the world around them.

Based on the above, it seems appropriate to highlight the most significant requirements for the development of the content of environmental education in the system of additional education. They are:

- compliance of the content of additional education with the modern needs of the state, society and the individual;
- compliance of approaches to the formation of environmental competence of students with the principles of the development of state educational standards;
- creating conditions for intensive personal development and continuous updating of the content of environmental education, ensuring changes in knowledge, activity and motivational-value components and levels of formation of environmental competence.

Indicators of determining the level of formation of environmental competence of students in additional education are a combination of knowledge, activity and motivational-value components; the ability to see and solve environmental problems based on the proposal and justification of hypotheses; set goals and plan activities based on the ideology of environmental protection; collect and analyze the necessary information on optimal methods of preserving ecological balance; the ability to apply environmental knowledge and skills in specific activities.

A high level of environmental competence characterizes responsibility for the state of the natural environment; knowledge of the basics of ecology and nature management; the ability to predict the consequences of human activity and find effective ways to solve environmental problems. Students can monitor and evaluate their activities related to compliance with the norms of a healthy lifestyle, rights and obligations in the field of environmental protection, rules of safe and environmentally-appropriate behavior in nature; environmental values occupy high positions, among which is the duty to protect nature.

The average level of environmental competence implies that students have a sufficient amount of knowledge and ideas about the world around them, about the interaction of living and inanimate nature, the organization and functioning of ecosystems and communities of various levels; poor knowledge of scientific methods for studying the natural environment and its components, as well as value orientations, lack of interest in the natural world and the desire to protect it.

The low level of environmental competence corresponds to the fragmentation of knowledge and misconceptions about the functioning of different ecosystems, communities of different levels, the lack of motives and the need to contribute to environmental protection. The students have not formed a safe and environmentally-appropriate behavior in the wild.

In the course of the research, pedagogical conditions that contribute to the effective formation of environmental

competence of students in additional education are highlighted. These include:

1. development of educational, methodological and logistical support for the process of environmental education;
2. creation of a developing ecological and educational environment;
3. activation of the cultural component of the humanitarian content of environmental orientation.

The first condition is the development of educational, methodological and logistical support for the process of environmental education, contributing to the information saturation of environmental classes in the system of additional education, the system integration of components of environmental education in various types of extracurricular activities of the process.

The second condition is the creation of a developing ecological and educational environment, including a psychological and pedagogical reality, combining the interaction of teachers and students on the protection and conservation of the environment; pedagogical influence on the ideological potential of ecological thinking of students, the formation of all elements of ecological consciousness aimed at the formation of a sustainable understanding of the value and interrelation of all natural ecosystems; fostering a sense of responsibility for the possible consequences of their actions and other people to preserve nature and life on the planet.

The third condition is the activation of the cultural component of the humanitarian content of environmental orientation in the system of additional education by means of humanitarian technologies of music and decorative and applied arts. The implementation of the cultural component implies the inclusion of the following activities in the content of musical classes and classes in decorative and applied arts, environmental protection measures: learning songs of an ecological orientation, creating products from natural materials in the process of decorative and applied creativity, participation in environmental protection activities.

## 5 Conclusion

The study included the study of the substantive and procedural characteristics of environmental competence. It is revealed that the structure of environmental competence includes knowledge, activity and motivation-value components and elements such as the ability to see and solve environmental problems; the need for environmental protection; the ability to apply environmental knowledge and skills in specific activities.

In the course of the research, the humanitarian model of the formation of environmental competence of students in additional education was substantiated. The basis of this model is the goal of determining the content-procedural characteristics of the formation of environmental competence of students in additional education by means of humanitarian technologies of music and decorative and applied arts. The humanitarian model created by us gives a holistic view of the content of the formation of environmental competence of students in additional education, its internal structure, the relationship and interdependence of its elements. It will help teachers to design ways to form environmental competence not only in the practice of additional education, which determines the practical relevance of the study.

## Literature:

1. Alekseev, S. V.: *Environmental Competence as a Predictable Result of Environmental Education*. In Actual Problems and Prospects for the Development of Biological and Environmental Education: a collection of materials of the VI International Methodological Seminar. Saint Petersburg: Tessa, 2006. 20-23 pp.
2. Buyanova, I. B., Kadakin, V. V., Kasko, J. A., Afonina, E. E.: *Assessment Competency Building in Future Physical Education Teachers*. Theory of Physical Culture, 6, 2019. 8-10 pp.

3. Chiranova, O. I., Maslova, S. V., Kuznetsova, N. V., Babina, S. A.: *Fostering Metadisciplinary Competences of Primary Schoolchildren*. Ad Alta: Journal of Interdisciplinary Research, 10/02, XIV, 2020. 14-17 pp.
4. Chopenko, L. S.: *Formation of Ecological Competence of Students of Grades 8-11 in General Education Institutions in the Process of Learning Geography*: PhD thesis. Cheboksary: Chuvash State Pedagogical University, 2008. 2019 p.
5. *Constitution of the Russian Federation* (adopted by popular vote on 12.12.1993 with amendments approved during the all-Russian vote on 01.07.2020). Available from [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_28399](http://www.consultant.ru/document/cons_doc_LAW_28399)
6. *Decree of the President of the Russian Federation No. 176 dated April 19, 2017 "On the Strategy of Environmental Safety of the Russian Federation for the period up to 2025"*. Available from <https://www.garant.ru/products/ipo/prime/doc/71559074>
7. Ermakov, D. S.: *Pedagogical Concept of Formation of Ecological Competence of Students*: PhD thesis. Moscow, 2009. 39 p.
8. Forum "Ecology of the Big City" 23/03/2021 – 25/03/2021. EXPOFORUM Convention and Exhibition Center, St. Petersburg, 2021.
9. Gorshenina, S. N., Marinkina, N. A., Mamaev, A. R.: *Pedagogical Conditions for the Formation of Technological Competence in Future Teachers of Physical Culture*. Theory and Practice of Physical Culture, 11, 2017. 12-14 pp.
10. Ignatieva, L. E., Melnikova, N. A. (Eds.): *International Scientific and Practical Internet Conference "Problems of Formation of Ecological Thinking in Modern Society"*. Saransk: Mordovian State Pedagogical Institute, 2014. 193 p.
11. Kobozeva, I. S.: *Professional Competence as an Effective and Target Basis for the Innovative Development of Higher Music and Pedagogical Education in the System of Continuing Education*. In Development of the Innovative Potential of Higher Music and Pedagogical Education in the System of Continuing Education. Saransk: Mordovian State Pedagogical Institute, 2013. 5-17 pp.
12. Kobozeva, I. S., Chinyakova, Yu. V.: *Formation of Economic Competence of Future Teachers*. Yaroslavl Pedagogical Bulletin, 1, 2017. 120-124 pp.
13. Kondrateva, T. N.: *Technology of Ethno Ecological Education of Preschool Children*. Problems of Modern Pedagogical Education. Ser. Pedagogy and Psychology: Collection of articles, 51, 2016. 250-257 pp.
14. Kondrateva, T. N., Shcheredina, N. I.: *Preparation of a Teacher for the Management of Design and Research Works of Preschoolers of Ecological Orientation*. Problems of Modern Pedagogical Education, 63, 2019. 108-111 pp.
15. Kondrateva, T. N., Ulanova, E. V.: *Ecological Education of Older Preschool Children in the Process of Project Activity*. In L. E. Ignatieva, N. A. Melnikova (Eds.), Problems of Formation of Ecological Thinking in Modern Society: materials of the International Scientific and Practical Internet Conference (July 4-5, 2014). Saransk: Mordovian State Pedagogical Institute, 2014. 86-89 pp.
16. Kurkina, N. R., Starodubtseva, L. V., Suldina, O. V., Semenova, O. A.: *Pedagogical Conditions for the Formation of Managerial Competencies of Future Teachers Through Practice-Oriented Educational*. Revista Inclusiones, 7, 2020. 44-53 pp.
17. Moiseev, N. N.: *About Worldview and Worldview*. Ecology and Life, 4, 1999. 5-9 pp.
18. Moiseeva, L. V., Nikitina, Yu. G.: *Formation of Ecological Competence of Younger Schoolchildren Yekaterinburg*. Pedagogical Education in Russia, 2, 2011. 203-210 pp.
19. Parshina, L. G.: *Pedagogical Conditions for the Formation of Competencies of Pedagogical University Students in the Process of Mastering Multimedia*: PhD thesis. Saransk: Mordovian State Pedagogical Institute, 2008. 212 p.
20. Pisareva, S. A., Tryapitsyna, A. P.: *Modern Approaches to the Assessment of Teacher Competencies*. In Modern Studies of Actual Problems of Professional Activity and Teacher Training: collective monograph. Ser. Continuous pedagogical education at the turn of the century. St. Petersburg: A. I. Herzen Russian State Pedagogical University, 2019. 61-83 pp.

21. Ryabov, A. M.: *Pedagogical Conditions for the Formation of Environmental Competence of High School Students*: PhD thesis. Vladimir, 2012. 182 p.
22. Sharonova, Yu. A.: *Pedagogical Conditions for the Formation of Environmental Competence of Rural Schoolchildren in the System of Additional Education*: PhD thesis abstract. Ulyanovsk: Ulyanovsk State University, 2006. 24 p.
23. Shukshina, T. I., Zamkin, P. V., Miroshkin, V. V., Parshina, L. G.: *Formation of Scientific and Pedagogical Competence of Teaching Staff in the Field of Physical Culture and Sports Based on the Actualization of Scientific Activity of Students (from the Experience of the Mordovian Pedagogical Institute)*. Theory and Practice of Physical Culture, 10, 2015. 11-13 pp.
24. Tatyana, T. V., Ozerov, A. A.: *The Socio-Pedagogical Project "Health Teacher" in the Formation of the Competence of Personal Self-Improvement of the Future Teacher*. Theory and Practice of Physical Culture, 8, 2016. 100-103 pp.
25. Yadov, V. A.: *Strategy of Sociological Research*. Moscow: Akademkniga, Dobrosvet, 2003. 596 p.
26. Yakunchev, M. A., Semenova, N. G.: *Actual Directions of Solving the Problem of School Environmental Education in the Context of the "Green Economy" Model*. Problems of Modern Pedagogical Education: Scientific Journal, 71(3), 2021. 322-326 pp.
27. Yakunchev, M. A., Semenova, N. G.: *The Structure and Content of the National-Regional Component of Environmental Education*. In Ecological Culture in the Context of Modern Realities, All-Russian Scientific and Practical Conference, October 23, 2020. Ulyanovsk: UIGPU named after I. N. Ulyanov, 2020. 50-56 pp.

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