

VII International Forum on Teacher Education

Formation of Ecological Culture of Students in the Conditions of Distance Learning

Liza A. Grineva* (a), Marina N. Alekseeva (b), Larisa A. Kazakova (c), Marina G. Zabbarova (d)

(a), (c), (d) *Ulyanovsk State Pedagogical University named after I. N. Ulyanov, 432071, Ulyanovsk (Russia), 4/5, Lenin's Square, eliz.grin9@yandex.ru*

(b) *Municipal Budget Educational Institute "Secondary School No. 72 with in-depth study of individual subjects", 432064, Ulyanovsk, Karbysheva street, house 26, ser76mar77@mail.ru*

Abstract

The environmental situation that has developed in Russia and around the world, the global nature of environmental problems and their peculiar manifestation in each region of the planet urgently require an early change of the thinking of humanity, individual peoples and each individual person. One of the reasons for this situation is the environmental illiteracy of the majority of the population and the inability to foresee the consequences of human intervention in nature. In this regard, environmental education as a continuous process is becoming a new priority area of pedagogical theory and practice. The importance of environmental education in modern world is beyond doubt. It is also obvious the earlier a child learns the basics of ecology, the more environmentally literate he will be, no matter what profession he will choose. Of particular interest today is the study of the impact of distance learning on the formation of environmental culture, especially during the coronavirus pandemic, which has provoked implementation of e-learning and distance learning technologies everywhere. Based on the above, the purpose of the study is to identify the impact of distance learning on the formation of environmental culture of schoolchildren. The following methods were used in the study: analysis of scientific and methodological and psychological-pedagogical literature; questionnaire (questionnaire "Studying the influence of distance learning on the formation of environmental culture of schoolchildren"); testing; mathematical processing of the data obtained.

Keywords: ecological culture, ecological education, distance learning, distance technologies.

© 2021 Liza A. Grineva, Marina N. Alekseeva, Larisa A. Kazakova, Marina G. Zabbarova

This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Published by Kazan federal university and peer-reviewed under responsibility of IFTE-2021 (VII International Forum on Teacher Education)

* Corresponding author. E-mail: eliz.grin9@yandex.ru

Introduction

Extreme situations taking place in the society and connected with the complex epidemiological situation in the world have made adjustments to the priorities of the main directions in the system of education in general and environmental education in particular. The transition of the education system to the distance format required serious consideration of the issue of forming an ecological culture among the younger generation in the new extreme conditions for all participants of educational relationship. It is important for the problem of forming an ecological culture, as the most important development space of environmental education, not to remain in the shadow of mass virtualization of the entire education system.. Of course, we should speak «not only about the reproduction of a fragment of the past and present culture in the content of environmental education, but also about its creative development under the pressure of modern challenges. This is reflected in many ways in the UNECE European Strategy on Education for Sustainable Development (2005) and corresponds to the priority function of environmental education – to become a subject of solving not only current, but also future social, environmental and economic problems in order to balance the development of society and nature – the so-called sustainable development" (Zakhlebny & Dzyatkovskaya, 2014).

Purpose and objectives of the study

Purpose and objectives of the study is to identify the impact of distance learning on the formation of environmental culture among schoolchildren.

The study was conducted in the municipal budget educational institution "Secondary School No. 72 with in-depth study of individual subjects" in Ulyanovsk. The study involved students of 3,6,8 forms with a total number of 230 people. The sample consisted of two groups: the first group consisted of primary school students, the second group consisted of basic school students. Such a sample provides representativeness and determines the expansion of the boundaries of the distribution of the research findings

Literature review

Modern pedagogical science has a huge theoretical material on the formation of ecological culture as an important element in the development of main, life-establishing qualities. The importance of the systematic educational process aimed at the formation of ecological culture is noted in the studies of such leading scientists as: Alekseev (2015), Deryabo (1999), Zverev (1980), Zakhlebny and Dzyatkovskaya (2014) Mamedov (2013), Yasvin (2000) and others.

The problem of environmental education in pedagogical science has been studied for a long time.

Great teachers of the past Rousseau, Pestalozzi, Disteverg, Ushinsky noted the important role of nature in the process of education and development of the child, they were sure that "nature is one of the powerful agents in the education of a person" (Ushinsky, 1948-1952).

Nowadays, the main provisions of the concept of environmental education are developed in a number of studies by Deryabo (1999), Zakhlebny and Dzyatkovskaya (2014), Zverev (1980), Ermakov and Suravegina (2005), Khotuntsev (2002) Yasvin (2000) and others. Thus, in the works of Zakhlebny and Dzyatkovskaya (2014), the system of ecological education is presented not only as a process, but also as a means of forming an "individual ecological culture". The article deals with the issue of "the formation of a new cultural vector - the culture of environmental design". Environmental learning should "not only teach how to explain the world, but also consider options for managing it from the point of its stability/instability, making responsible decisions" (Zakharov, 2008).

The environmental personality development is closely connected with the process of forming of ecological culture. Ecological culture as a whole, is one the integral traits of a person that is determined by the direction of his life activity, it arises as a new mental formation of a person and influences on the worldview.

That is why the working out of new forms and approaches aimed at involving students in environmentally rational activity, the process of getting new knowledge, skills, skills of interaction with nature, the formation of a desire for non-pragmatic interaction and the need to deal with the natural world, the motivation for aesthetic mastering, the formation of ethical motives for nature protection is an important purpose of the process of formation of ecological culture in the context of changing conditions and the active usage of distance forms and e-learning in the educational process.

Indeed, ecological culture is manifested in human behavior, which is determined by his ecological consciousness, skills and knowledge in the field of environmental conservation. That is why the issues of the impact of distance learning as a mass alternative in the education system in general and environmental education in particular require special attention.

Methodology

The following methods were used in the study: analysis of scientific and methodological , psychological and pedagogical literature; questioning (questionnaire "Studying the influence of distance learning on the formation of environmental culture of schoolchildren"; testing (Deryabo, 1999, Yasvin, 2000); mathematical processing of the data obtained.

Results

Ecological culture is consider as a result of the formation of environmental knowledge, skills and students' achievements of requirements for the results of learning of different school subjects. From our point of view, ecological consciousness is an equally important component of human environmental culture. Ecological consciousness is understood as the idea of the natural world through environmental knowledge: facts, information, conclusions, generalizations about the relationships and exchanges taking place in the biological world and in the environment as a whole, as well as the attitude of a person to them. Aesthetic feelings and environmental responsibility are an integral part of ecological consciousness, while the subjective perception of an object of nature is an important characteristic of it.

A person's perception and understanding of his abilities to influence on nature, the definition of the goals of such impact, the assessment of results for the intended behavior in the environment, taking into account the consequences of such behavior and knowing himself as an element of the ecological system is an integral part of ecological consciousness.

We believe that the main purpose of ecological consciousness as an integral part of a person's self-development in education is the development of creative principles of thinking that would allow him to set goals that reflect the real relationship between man and nature in the dynamics of their development, and to realize these goals using the entire volume of available knowledge and the richness of his inner world. To put this differently, the main purpose is to make environmental behavior based on ecological consciousness become a students' lifestyle.

The result of the maturity of ecological consciousness is ecological behavior, as the environmental health is known to greatly depend on the human behavior. Taken together person's own actions (a set of states, specific actions, skills and abilities) and his attitude to the actions of other people, directly or indirectly connected with the impact on nature in the process of using natural resources, is environmental behavior (Nikolaeva, 2013). Ecological behavior, like ecological consciousness, is always peculiar, it reflects the unique traits of a person. On the one hand, it is determined by the level and features of ecological consciousness, and on the other hand, by the necessity to meet human needs.

Thus, the effectiveness of the educational process is directly dependent on the effectiveness of ecologically integrative forms of subject-subject relations in the environmental educational space, with the active use of distance technologies among other things.

Consider the evaluation of the effectiveness of distance learning in obtaining information and participating in environmental activities (Table 1.)

The first set of questions was offered with a choice of answer and was aimed at identifying the most popular ways of obtaining information among students, as well as the impact on the cognitive component in the formation of environmental culture.

Indeed, the cognitive component, according to Ermakov (2008), presupposes the formation of a system of environmental knowledge (natural science, worldview, regulatory, practical) and ways of thinking that act as a guide for environmental activities. The system of knowledge the cognitive component contains is the basis for understanding the holistic ecological picture of the world, which contributes to the explanation of interactions within ecosystems, awareness of the role and place of man in the universe; revealing, solving and preventing environmental problems (cognitive problems, modeling, practical transformation of reality); mastering environmentally safe methods and ways of life; forming value attitudes towards nature, to one's own environmental activities.

Modern ecology is not a branch of biological science any more. It has changed into an integral discipline, containing elements of geography, geology, chemistry, physics, sociology, cultural theory, economics, and law. Obviously, it is difficult to fully master such a volume of knowledge. However, the process of the formation of knowledge is not an end in itself. Speaking about the competence approach, we should say, the concepts, theories, and laws of ecology are only an indicative basis for the environmental activities. Knowledge should be acquired, extracted, "discovered" by the student himself, on this reason only they will become significant for him (Ermakov, 2008). In our work, we accept the conclusions made by Ermakov. So, the cognitive component is important in the structure of the model for the formation of the ecological culture of students, besides it is that very component distance learning forms have a direct impact on foremost.

The second block included questions to study the opinions of the interviewees on the impact of distance learning on the emotional-value and behavioral-activity components of environmental culture.

Table 1. Evaluation of the effectiveness of remote forms of obtaining information and participating in environmental activities

Questions	Answers
Do you know anything about global ecological problems?	yes-218 st no-12 st
Where from have you known about them?	A. educational platforms-37 st., B. social networks– 78 st., C .media organizations and television– 70 st., D. others– 45 st.
How had you got the information about environmental campaign, events, competitions before online learning started?	A at school– 162 st., B. on school Internet resources (school website and Network City. Education.) – 16 st., C. on the Internet on various sites– 4 st., D. from friends and acquaintances– 48 st.
When does online learning have advantages?	A. when to find some information on environmental issues - 216 st., B. when you need to cooperate to take actions to save natural resources– 14 st.
What Internet platforms do you visit most often if you need to find information related to environmental issues and environmental events?	A search engine - 176 st., B. electronic library system-37 st., C. learning websites- -9 st., D. educational platforms – 26 st.
Have you become more active in contests and promotions during the pandemic? Grade yourself on a scale from one to five	1-no – 17 st., 2-have remained the same active – 148 st., 3- a little - 58 st, 4 –yes – 2 st., 5- have become much more active - 5 st.
What form of participation in environmental events would you chose when all restrictions are lifted?	A. online learning – 32 st., B. online and in-person learning – 187 st., C. in-person learning– 11 st.
What form of individual study on the assimilation of environmental knowledge do you consider the most acceptable?	A. study using educational materials– 47 st., B. study in the library– 25 st., C. study using the Internet– 89 st., D. study during online-learning - 69 st.
How has your desire to take part in environmental campaign changed during the online learning in comparison with in-person learning?	A. increased- 8 st., B. reduced– 69 st., C. has not changed – 126 st., D. not sure– 27 st.
When do you truly feel the beauty of nature, its value, and understand its significance for yourself and other people?	A. being in nature– 87 st., B. communicating in the Internet during the pandemic - 32 st., C. doing real team tasks– 98 st., D. others- 13 st.
What is the best way to learn competent behavior in nature and be ready to solve ecological problems?	A. being in nature– 78 st., B. trying to find information in the Internet– 47 st.,

	C. implementing environmental projects and participating in real-life environmental campaign – 105 st.
--	--

To get more reliable figures the survey participants were asked to give the detailed answer.

Task 1. "Name some environmental activities that are organized by the school"

Task 2. "Name some environmental activities conducted at the school you personally participated in."

Such questions allow to understand if the participants in educational relations are aware enough of the issue of environmental activities conducted at the school and the degree of activity of the participants in educational relations.

The prevailing responses are shown in Figure 1.

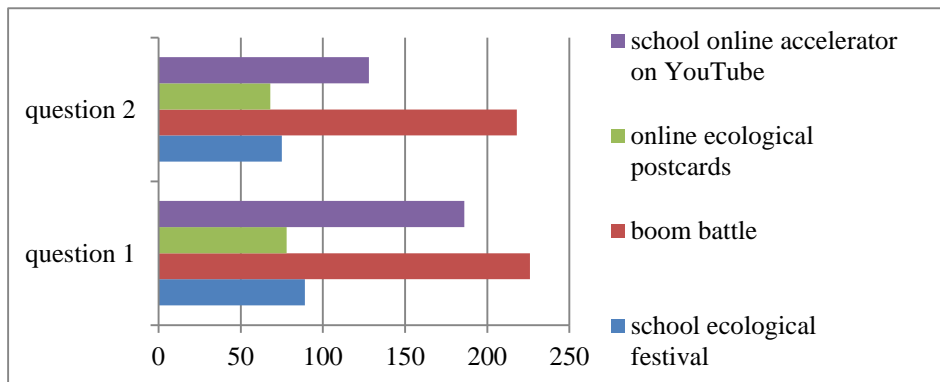


Figure 1. Participants' responses on awareness of school events.

Figure 2 shows the results of a survey of children on their internal motivation when participating in certain environmental activities. The question was: "Why did you decide to take part in environmental events?"

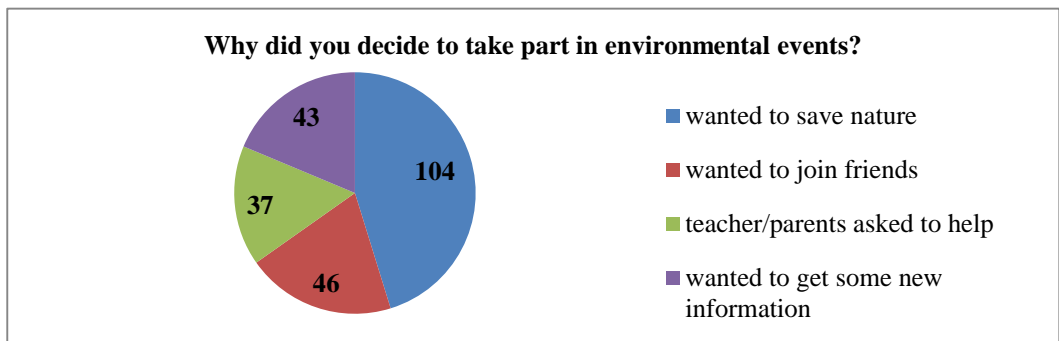


Figure 2. Questionnaires of children on the issue of their intrinsic motivation

The theoretical justification of the study of the forming the ecological culture of students in the conditions of distance learning was based on the comprehensive view of the topic of psychological and pedagogical aspects; on determining the relevance and contradictions that arose during the study of this problem; on revealing the content and structure of the basic concepts of the study; on identifying the pedagogical conditions for its implementation in comprehensive schools. As a result, the following structural components of ecological culture were identified:

- the motivational component shows the level of students' attitude to the environment (motivation of environmental activities). Its indicators are the motives and cognitive needs for continuous improvement of one's own environmental education, readiness to get environmental knowledge and to put knowledge to use, the pursuance of one's own initiative, freedom of choice, independence and creative activity, endurance and stamina, purposefulness, perseverance, concentration and discipline;

- the cognitive component reflects the level of awareness (environmental literacy) of the student's personality in ecology. Its indicators are the depth, consistency of environmental knowledge, skills, experience, worldview in subject study, readiness and ability to use environmental knowledge in environmental activity, analyze and infer cause-and-effect relationships of environmental problems, predict the environmental consequences of human activity, be master of the norms and rules of organizing activities;

- the emotional-valuable component shows the level of awareness of significance of love for nature. Its indicators are a positive sensory attitude to the nature, phenomena and objects of nature, as well as to oneself, receptivity to objects and phenomena of the natural and social world, artistic and aesthetic objects, art, comprehension and understanding of them;

- the behavioral and activity component reflects the level of environmental consciousness. Its indicators are the awareness, acceptance and using of students' knowledge and skills in environmental activities; readiness for active actions; the use of skills and experience in an environmentally competent labor organization when solving environmental problems; a sense of responsibility for their behavior in the environment.

The maturity of these structural components of ecological culture will lead to the formation of a system of personal roles in students' environmental culture: «a thinking person», «a feeling person», «a creative person»; it will help to give them an answer to the questions: «Who is a man?» and «What is his purpose in nature and society?».

Discussion

The results obtained during the study have revealed both the negative consequences of distance education and its positive influence on the formation of the ecological culture of schoolchildren. Speaking about the negative effect, the following can be distinguished: only 14% of students participating in the study have the emotional and valuable sphere formed at a high level, 11% of students have the behavioral and activity sphere formed at a high level, 55% - at an average and 24% - at a low level.

The formation of the cognitive sphere has more positive dynamics: at a high level – 58%, at an average level-36%, at a low level-6%. Diagnostics of the formation of the level of ecological culture was carried out with the help of the method of diagnosing the motivation of interaction with nature «Alternative». It was used in order to study the students' intention to act in a certain way in the process of interaction with natural objects in the structural components of ecological culture: emotional-value, cognitive, motivational and behavioral-activity (Yasvin, 2000) and the verbal associative method «AESOP» (which is interpreted as emotions-knowledge-protection-use). The purpose of this method is to study the types of dominant attitudes towards nature in the structural components of ecological culture: emotional-value, cognitive, motivational and behavioral-activity (Deryabo, 1995).

Conclusion

Thus, analyzing the psychological and pedagogical aspects of the formation of the ecological culture of students, despite the very diverse responses of the respondents, the results of the survey and assessments allow us to draw the following **conclusions**:

1. During the online learning, the volume of information received from electronic sources which include library information centers, augmented and virtual reality systems, educational platforms, electronic manuals, tests and modern learning tools increased up to 80%. Environmental education with the use of e-learning and distance learning technologies, as a system of innovative information and communication technologies, has a great number of advantages. Online learning allows you to model the real natural and life (social) situations. It should be noted that when using e-learning and distance learning technologies, a model of the appropriate environmental situation can be realized, and students have the opportunity to react this model as if they are in real life situation (Knyazeva, 2006).

2. A comparative analysis of the data of diagnostic tests which were conducted in 2019 and 2021 to determine the level of environmental culture formation in accordance with the structural components: cognitive, emotional-value and behavioral-activity revealed minor changes in the desire to search, receive and process information of environmental content when learning distantly,

3. Taking into consideration a cognitive component as an important indicator of the formed ecological culture, it should be noted that the most friendly environment for the organization of environmental learning and the formation of ecological culture in the period of pandemic and other extreme situations is the global computer network. This is due to the unique characteristics of the Internet, which allow, on the one hand, to organize active interaction between all participants in educational relations, and, on the other hand, to provide students with a significant amount of diverse environmental information. Speaking about environmental learning system we should notice modern technologies the distance learning provides students with influence on the competitiveness of the individual's environmental knowledge. Besides, on the world-wide web there is some information that can have a negative influence on the formation of students' consciousness. In order to reduce the risks of students receiving unreliable environmental information in social networks while learning distantly, it is extremely important to use special pedagogical tools. In particular, during the study, Eco-navigator was created and published (Grineva, Sosnovskikh & Alekseeva, 2020).

4. Besides, the decrease in the results of the level of ecological culture formation in its emotional-value component exactly (5 % on average) was revealed. The decrease in the results concerning behavioral-activity component which draws up 24% is of particular concern. This indicates that distance learning imposes sharp restrictions on the practical implementation of a student's environmental protection activity, which is extremely important for the personal development.

5. Thus, the decline in the role of the naturalistic approach in environmental education, the lack of real interaction of students with environment, which can incline students to independent research and complex thinking (Savvateeva, Spiridonova & Lebedeva, 2019), makes students less impressionable to the sensory-expressive elements of natural objects, a sharp restriction of the practical-effective component allows us to conclude that the most front rank form of education in the formation of ecological culture is a mixed form of education with the definite priority of face-to-face interaction.

References

- Alekseev, S.V. Pedagogy of the environment and sustainable development: theory and practice [Text]: monograph / S.V. Alekseev, N.I. Koryakina, E.A. Ripacheva; under total. ed. S.V. Alekseeva. - SPb.: SPb APPO, 2015. -- 230 p. - (Scientific schools of the Academy).
- Ermakov, D. S., & Suravegina, I. T. (2005). *From studying ecology to the solution of environmental problems: A monograph*. Novomoskovsk: URAO.
- Ermakov, D. S. (2008). Environmental competence of students: content, structure, features of formation. Moscow. Retrieved from: <file:///C:/Users/ACER/Downloads/ekologicheskaya-kompetentsiya-uchaschihsya-soderzhanie-struktura-osobennosti-formirovaniya.pdf>
- Deryabo, S. D. (1999). *Ecological psychology: diagnostics of ecological consciousness*. Moscow: Moscow Psychological and Social Institute.
- Deryabo, S. D. (1995). Methods of diagnostics and correction of attitude to nature [Text] / S. D. Deryabo, V. A. Yasvin. - M.: TSKFL RAO, 147 p.- (Series "Ecological psychology and pedagogy". Russian Academy of Sciences. education, Psychology. in-t, Center complex. formation of personality).
- Grineva, E. A., Sosnovskikh, N. V., & Alekseeva, M. N. (2020). *Ekonavigator: textbook*. Ulyanovsk: Ulyanovsk State University.
- Knyazeva M. D. (2006). *Innovations in higher education. Distance education in the field of continuous environmental education*. Moscow: Academy of Natural Sciences.
- Khotuntsev, Yu. L. (2002). *Ecology and environmental safety: A textbook for university students studying in the specialty 033300-life safety*. Moscow: Academia.
- Mamedov, N. M. (2013). *Ecology and sustainable development: Textbook*. Moscow: Publishing house of the MGADA Center.
- Nikolaeva, L. A. (2013). *Ecological psychology*. Yaroslavl: Yaroslavl State University named after P. G. Demidov.
- Savvateeva O. A., Spiridonova A. B., Lebedeva E. G. (2019) Modern ecological education: Russian and international experience. *Modern problems of science and education*, 5. Retrieved from: <http://science-education.ru/ru/article/view?id=29188>
- Ushinsky, K. D. (1948 – 1952) Collected edition/ K. D. Ushinsky; Acad. ped. science RSFSR. Institute of Theory and History of Pedagogy. – Moscow: L.: Acad. ped. science RSFSR.

Yasvin, V. A. (2000). *Psychology of attitude to nature*. Moscow: Smysl.

Zakharov, V. M. (2008). *Formation of ecological culture and development of the youth movement*. Moscow: Akropolis, Center for Ecological Policy and Culture, Center for Ecological Policy of Russia.

Zakhlebny A. N., & Dzyatkovskaya E. N. (2014). *Ekologicheskoe obrazovanie v kultury – kultura v ekologicheskom obrazovanie* [Ecological education in culture-culture in ecological education]. Retrieved from: https://mosmetod.ru/metodicheskoe-prostranstvo/srednyaya-i-starshaya-shkola/ekologiya/konferentsii-seminary-master-klassy/ekologicheskoe-obrazovanie-na-etape-vnedreniya-fgos-v-osnovnuyu-shkolu/ekologicheskoe-obrazovanie.html#_ftn1

Zverev, I. D. (1980). *Ecology in school education: A new aspect of education*. Moscow: Znanie.