

ESSENCE AND FORMATION OF ENVIRONMENTAL COMPETENCE OF SCHOOLCHILDREN

Olga Prutsakova,

candidate of pedagogical sciences, senior researcher,
leading researcher of the laboratory of extracurricular education
Institute of Problems of Education of the National Academy of
Pedagogical Sciences of Ukraine

Kyiv, Ukraine

ORCID ID 0000-0002-7482-8404

drontik@ukr.net

Abstract. The article pays attention to the theoretical and practical significance of the problem of formation of ecological competence of schoolchildren, urgency of this pedagogical task in the context of modern tendencies of sustainable development of society. The concept of ecological competence is considered, the accompanying concept of "zone of ecological responsibility" of schoolchildren is singled out, it is emphasized that the level of quality is manifested in the ability to make environmentally sound decisions in the environment and the environment and actions and actions that cause minimal damage. Specific data on the formation of various aspects of environmental competence in primary school students, obtained in the process of experimental work. The research used the following methods: questionnaires of students and teachers, students' solutions to life situations, observation of their behavior and motivation of actions and deeds in nature and in relation to nature.

Areas where it is possible to determine the formation of ecological competence of schoolchildren are outlined: in the sense of involvement in environmental problems, de pragmatization of nature, regulation of personal consumption, reduction of anthropogenic pressure on the environment and in general - improving its condition.

Comparison of the obtained results with scientific achievements concerning the ecological education of schoolchildren revealed that the presented research expands the results of scientific research in the direction of research of the formation of ecological competence of schoolchildren.

Keywords: ecological education, ecological competence, sustainable development of society, environmental protection, education of sustainable development, "area of responsibility"

СУТНІСТЬ І СФОРМОВАНІСТЬ ЕКОЛОГІЧНОЇ КОМПЕТЕНТНОСТІ ШКОЛЯРІВ

Ольга Пруцакова

кандидат педагогічних наук, старший науковий співробітник,
провідний науковий співробітник лабораторії позашкільної освіти
Інститут проблем виховання НАПН України

м. Київ, Україна

ORCID ID 0000-0002-7482-8404

drontik@ukr.net

Анотація. У статті приділяється увага теоретичному і практичному значенню проблеми формування екологічної компетентності школярів, актуальності цього педагогічного завдання в контексті сучасних тенденцій сталого розвитку суспільства.

Розглядається поняття екологічної компетентності, виокремлюється супутнє поняття «зона екологічної відповідальності» школярів, акцентується, що рівень сформованості якості виявляється у вмінні приймати екологічно доцільні рішення у довкіллі і стосовно довкілля та вчинках і діях, які наносять довкіллю мінімальної шкоди. Наведено конкретні дані щодо сформованості різних аспектів екологічної компетентності у школярів основної школи, отримані в процесі експериментальної роботи. У процесі дослідження використано методи: анкетування школярів та педагогів, розв'язання школярами життєвих ситуацій, спостереження за їх поведінкою і мотивацією дій і вчинків у природі і стосовно природи.

Окреслено сфери, де можна визначити сформованість екологічної компетентності школярів: у почутті причетності до екологічних проблем, депрагматизації ставлення до природи, регуляції особистого споживання, зменшенню антропогенного тиску на довкілля і загалом - покращення його стану.

Порівняння отриманих результатів з науковими доробками, які торкаються екологічної освіти школярів, виявило, що презентоване дослідження розширює результати наукових розвідок у напрямі дослідження сформованості екологічної компетентності школярів.

Ключові слова: екологічна освіта, екологічна компетентність, сталий розвиток суспільства, збереження довкілля, освіта сталого розвитку, «зона відповідальності»

Relevance of research. The current ecological situation is characterized by features, the complex of which is not characteristic of the civilized past. These are the depletion of non-renewable and uncontrolled consumption of exhaustible resources, the production and accumulation of non-degradable waste and the supercritical increase in pressure on the biosphere of the mass of people and service animals. The modern world is characterized by the concept of "fullness" (Herman Daley) - a lack of space and resources not covered by human activities. Civilization was formed in the times of unknown territories and unlimited resources. In such an "empty world" formed political and social ideologies, social institutions, habits of thinking and acting, the nature of relations with the environment. However, humanity has entered a "full world", with already thoroughly developed territories and depleted resources, in a world where 97% of the mass of vertebrates are humanity and livestock [7]. Changing global concepts from "empty world" to "filled world" requires changes in the minds of ordinary citizens. The presence of the global environmental crisis reinforces the relevance of environmental education of children and youth, understanding of their place and role in the world. Accordingly, the content of modern environmental education needs to be updated and substantiated on a

modern scientific basis, taking into account value aspects, environmental competence and the means aimed at their formation.

The strategy for the development of the national education system must be formed in accordance with modern world processes, the requirements of post-industrial civilization, and the integration of the national education system into the European and world educational space. The competency-based approach to modern education was proclaimed by Council of Europe experts in the early 1990s and is now seen as one of the mechanisms for surviving an environmental crisis.

The relevance of this issue is reflected in Article 12 of the Law of Ukraine "On Education" [1], where environmental competence is one of the key competencies. Accordingly, the task of its formation is actualized in the concept of the New Ukrainian School.

The specificity of the modern social and environmental moment stimulates increased attention to the formation of this type of competence of citizens, which should ensure stable and inexhaustible development of societies, the need for urgent motivation to preserve nature and reduce anthropogenic pressure on it. After all, many citizens develop a sense of impunity, rather than understanding that the response from nature is irreversible, although it may be delayed in time. For schoolchildren, the choice of competent ways of interacting with nature is especially relevant, because the motivation to preserve nature "for the sake of future generations of people" has little effect on them.

Analysis of recent research and publications. The scientific results obtained by foreign experts relate to standards and trends in the formation of competence, expressed in the documents of the International Department of Standards, Concepts and Strategies for Sustainable Development - Agenda [2], and UN General Assembly Resolution "Transforming our world" - Sustainable Development [5], reports of the Club of Rome (E. Weizsäcker, A. Wijkman [7]). The study is based on the provisions on the formation of "ecological personality" and the peculiarities of its interaction with the environment -

Teilhard de Chardin, E. Zuss, A. Schweizer, M. Moiseev, B. Kommoner. Important for the study are the general approaches identified in domestic studies by S. Bondar, L. Lepikhova, L. Khoruzha, A. Khutorsky, N. Pustovit, L. Tytarenko, where attempts were made to define the generalized concept of competence and specify it in relation to different age and social groups, fields of knowledge and areas of activity. Thus, I. Taranenko notes that the concept of competence is based on the idea of educating a competent person and employee who not only has the necessary knowledge, professionalism, high moral qualities, but also is able to act adequately in appropriate situations, applying this knowledge and taking responsibility. for a certain activity ”[6].

The result of pedagogical research is the understanding of competence as a combination of knowledge, values, motivation and activity components, united in a whole willingness to act and be responsible for the consequences of their own actions. Also essential for this study is the separation of two types of environmental competence - professional and everyday (everyday), inherent not only to professionals (professional), but also to all ordinary citizens, regardless of social and professional roles (everyday) - H Pustovit, O. Prutsakova [4]. Students have exactly the last type of competence, which is characterized by the appropriate level of formation and is manifested in the immediate environment for students - "area of responsibility" [3].

Formulation the purpose of the article. The purpose of the article is to define the concept of "environmental competence of students" and their "area of responsibility", present the features of the formation of environmental competence of students, their awareness of involvement in environmental issues, their own environmental impact, understanding of traits of a competent person.

Theoretical foundations of the study. Given the exacerbation of global environmental problems, the emergence of global challenges and risks, we note that environmental aspects are crucial in sustainable development education. And the task of modern environmental education is the formation of environmental competence of students. Under environmental competence we

understand the ability (ability) of the individual to make environmentally sound decisions and act in such a way as to cause the least possible damage to the environment [3]. Note that environmental competence is a complex entity based on awareness and environmental values, and manifests itself - in making environmentally friendly decisions and environmentally sound behavior. One of the prerequisites for understanding the need to preserve the environment, limit consumption or adapt to climate change and other global challenges is to make students aware of their involvement in environmental issues and their willingness to participate in solving them "here and now".

Ecological competence begins to be formed with the mastery of certain ecological information by a person. Especially with regard to its "area of responsibility" - the part of the environment where decisions are made (both in favor of preservation and destruction of the environment), and which is covered by its actions, activities and consequences. This immediate environment is determined not by the territory, but by the nature of human activity, its demands and needs. And the amount of resources needed to meet those needs. Therefore, it is the regulation and self-regulation of consumption needs by reducing the pressure on the environment, the personal "environmental footprint". For example, the realization that with our money we support a certain type of management and nature management (balanced or exhausting) is the basis for making a competent decision about what to choose for consumption.

Research methodology to obtain empirical data in the study used student questionnaires author's questionnaires, observations, author's situational methods of decision-making. The questionnaires contained open and closed questions, which always included the possibility of "your option". Questionnaires and situational methods related to the choice of actions and deeds in certain situations specified the motive, because the same actions can have different reasons. To ensure greater reliability of the received empirical information, the questions and tasks were structured in such a way as to ensure mutual verification and complementarity of answers.

The identified methods were aimed at clarifying the formation of some aspects of environmental competence of students, obtaining data on students' understanding of their involvement in the emergence and solution of environmental problems, environmental impact assessment due to the peculiarities of their families' consumption. It was also found out when students of different ages consider it necessary to participate in nature protection and whether they consider it necessary at all.

We were also interested in which personality students of different ages consider competent, which traits are considered a priority in this formed quality, and which are insignificant.

The empirical study involved 380 students in grades 6-11, of which 167 boys and 213 girls (145 adolescents studied in grades 6-7, 157 - in grades 8-9, and 78 - high school students). The study was conducted on the basis of Pereyaslav-Khmelnysky secondary school I-III degrees №3, Rivne educational complex "Secondary school I-III degrees-lyceum" №19, secondary school №35 Kyiv, secondary school №280 Kyiv specialized school №305 of the city of Kyiv and Glevakhiv secondary school of I-III degrees.

Results of the research. Modern content and traditional methods of environmental education in general do not contribute to the effective formation of environmental competence of students in full. First of all - due to the content of environmental education, which practically does not consider any anthropogenic aspects, or global environmental challenges, or the peculiarities of consumption in modern and relevant contexts. The analysis of green school programs revealed environmental issues, primarily related to the interaction of components of natural complexes and the study of human impact on remote landscapes. The predominance of such information affects the formation of students' knowledge without touching values, decision-making, understanding and compliance with the norms of environmentally friendly behavior.

The key to the formation of environmental competence is the awareness of personal involvement in environmental problems and willingness to

participate in their solution. For example, 6th graders feel personal involvement in environmental issues - 65.3 % of students say that they affect the environment, 19.2 % of respondents deny the impact. At the same parallel, the least those who did not decide or did not answer the questions (15.5 %).

The question of involvement and readiness provoked a significant number of refusals from students in grades 8-9. This may indicate that students have not even considered the issue and therefore do not have their own opinion on it. However, with age, the number of "missing" answers decreases: from 2.3 % to 0.9 % in grades 8-9 and to 0 among high school students. However, the number of people ready to participate "today" is growing: from 33.3 % in 8th grades to 44.6 % in 9th grades and 58.0 % in 10th-11th grades. Also balances the number of responses of students who link environmental protection only with future professional activities: from 27.6 % in 8th grades to 29.5 % in 9th grades, 26.0 % - in 10th-11th grades . And if none of the eighth-graders and high school students chose the answer "Never ...", then in the 9th grade the following answers are recorded: 1.8 % ("it does not concern me"; "there will be another profession").

6th graders are aware of the integrity of nature, the dependence of man on nature, realize that the impact of each and the family on the environment can be both positive and negative - "everyone affects, and I and my family can protect nature, and can negatively influence". The rationale for schoolchildren of this age is characterized by the following explanations: "Man influences that he lives and helps the environment to survive without polluting the ecosystem", "we are part of nature", "of course, because we are also part of nature", "if I I will not help nature - it will die "and so on.

With age, the number of students who believe that they and their families have an impact on the environment decreases. Thus, in the 7th grade the number of respondents of both positions is the same (38.5 % each), the number of refusals to answer and those undecided students is increasing (compared to the 6th grade) - 23.0 %. Then - in the 8th grade - the number of students who deny

the impact on the environment exceeds 50.0 % (believe that 26.6 % have an impact). Rejections and uncertain answers account for 23.4 % in this parallel. Moreover, the lack of answers by eighth-graders is motivated by the fact that "it does not concern us, because this must be done by individual organizations."

The growing number of students who believe that they and their families do not affect the environment continues until the 9th grade. The previous trend is partially correlated with the next - in grades 8-9, the number of those who positively assess their own impact on the environment and the impact of their family decreases. Such answers were given by 14.9 % of eighth-graders and 10.7 % of ninth-graders. Moreover, from the 8th to the 9th grade, the number of negative assessments of one's own and family's impact on the environment almost triples. In the 8th grades such answers are 8.1 %, and in the 9th grades they are already 23.2 %. But more than a third of high school students actually believe that their impact on the environment is positive. But it does not consist in active nature protection actions, but in observance of elementary norms and rules of behavior in nature. Among the works of high school students there are answers that indicate disbelief in the feasibility of environmental activities: "Our family does not pollute the environment - it has a positive effect. But a few people can't do much"; "Our family has a positive impact on the environment, but still a few people will not get better without the help of others."

Significant, given the conceptual ideas of sustainable development, is the dynamics of the number of responses in which environmental competence is associated with the need to save water, electricity, which is an elementary manifestation of the willingness to control their own consumption. The number of such answers increases from 8th to 9th grades from 3.2 % to 10.4 %, and again decreases slightly in grades 10-11 - 9.2 %. Quite often in the senior classes there is a complex of the following answers: "the ability to maintain their own health - to follow the rules of behavior in nature", which, in essence, means balancing their own interests with the possibilities of nature, the need to preserve it. This idea is clearly and generalized in one of the works of 10th

grade: "the ability to survive in difficult environmental conditions without harming the environment."

At the same time, if only a third of students are aware of human dependence on nature and general theoretical responsibility for the state of the latter (option 1), then two thirds remain supporters of the "special" position of man as "master", "consumer" of natural resources. Such worldviews determine the direction of practical interaction with nature in the relevant part of students.

Students were asked to define a competent person: "a competent person is one that..." They were given the opportunity to make several choices and thus determine the structure of this personality characteristic. The list of possible answers included significant features of competence, as well as some insignificant external features that can be associated with competence at the household level (for example, "holds a high position").

According to 69.2 % of 6th grade students, they are a person who takes responsibility. 57.7 % of seventh-graders and 69.6 % of eighth-graders think the same. Therefore, the majority of primary school students consider a competent person responsible. Students also consider a competent person to be an experienced person (34.6 %; 46.0 %; 56.6 %). For students of each of the parallels, you can create a "portrait" of a competent person. In particular, for students:

1. 6 classes are a "responsible experienced professional",
2. 7 classes - "a responsible person who knows a lot and achieves the goal at any cost."
3. 8 classes - "an experienced person who is able to take responsibility and achieve the goal at any cost."

Primary school students do not consider the position to be an indicator of competence, but they are aware of the connection between competence and professionalism, with the closest being in the 6th grade (34.6 %).

In general, the rating of knowledge in the structure of competence was quite low: only 7.6 % of 6th grade students believe that a "competent person" is

a "knowledgeable person". This thesis is supported by 50.0 % of seventh-graders, 12.7 % of 8th and 9.8 % of 9th graders, and 13.8 % of high school students. Thus, none of the age groups considers them a determining indicator of a competent person.

Attention is drawn to the works, which indicate complexes of the following features: "knowledge-experience-responsibility" - them in grades 10-11 16.0 % and "knowledge-experience-professional" - 7.0 % (grades 10-11), which are the most complete answers to this question.

Conclusions from the study and prospects for further exploration in this direction. One of the most significant shortcomings of domestic environmental education is the disproportion between a fairly high level of awareness of students on environmental issues (mostly - the global level) and the practical application of knowledge and decision-making in specific life situations. The results of the experimental study show that primary and secondary school students do not sufficiently understand and evaluate their own impact on the environment and cannot correctly assess its scale. And since a little more than half of schoolchildren are aware of their own involvement, students generally place the responsibility for the state of the environment on others.

Analysis of the content of subjects that contain environmental issues shows the contradiction between the globality of the information presented and the ability of students in their application, limited social role and age psychophysical characteristics. The content of environmental education needs to be significantly supplemented and changed in the direction of expanding both the vision of global risks (adaptation to climate change) and the regulation of consumption and conservation of biodiversity. These aspects correspond to the tendencies of sustainable development education and form the ecological competence of students.

The obtained results show that in ecological education of schoolchildren the forms and methods directed by pupils on the decision of problems of the

nearest environment, that is in their "zone of responsibility" will be effective. They should be used to develop decision-making skills and to act in the part of the environment that students can directly influence by showing their own environmental competence. This will provide an opportunity to shift the emphasis from the formation of knowledge "about a safe environment" to a system of values, actions and actions "for a safe environment."

СПИСОК ВИКОРИСТАНИХ ДЖЕРЕЛ

1. Закон України «Про освіту». URL: <https://zakon.rada.gov.ua/laws/show/2145-19>
2. Програма дій «Порядок денний на ХХІ століття» / Переклад з англійської: ВГО «Україна. Порядок денний на ХХІ століття», К.: Інтелсфера, 2000.360 с.
3. Пруцакова О.Л. Сутність та види екологічної компетентності особистості *Теоретико-методичні проблеми виховання дітей та учнівської молоді*. Вип.8., Кн.2. Київ. 2005. С. 18-20
4. Пустовіт Н.А, Пруцакова О.Л., Руденко Л.Д, Колонькова О.О. Формування екологічної компетентності школярів. К.: «Педагогічна думка», 2008. 64 с.
5. Резолюція Генеральної асамблеї ООН «Перетворення нашого світу». URL: <http://sdg.org.ua/ua/resources-2/344-2030-2015>
6. Тараненко І. Г Розвиток життєвої компетентності та соціальної інтеграції : досвід європейських проблем. Кроки до компетентності та інтеграції у суспільство / За ред. І. Єрмакова. К: Контекст, 2000. С. 37–40
7. Weizsaecker E., Wijkman A. Come On! Capitalism, Short-termism, Population and the Destruction of the Planet. Springer,.2018. 220 p.

REFERENCES

1. Law on Ukraine «On Education». (2017). [in Ukrainian]. Retrieved from <https://zakon.rada.gov.ua/laws/show/2145-19>
2. Agenda 21. United Nations Conference on Environment and Development (Earth Summit), Rio de Janeiro. (1992). Retrieved from <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>
3. Prutsakova, O. (2005) The essence and types of ecological competence of the individual. Theoretical and methodological problems of raising children and students. Issue 8.in Vol.2. Kyiv. P.18-20 [in Ukrainian].
4. Pustovit, N, Prutsakova, O., Rudenko, L, Kolonkova, O. (2008) Formation of ecological competence of schoolchildren. К.: «Pedagogical thought», 64 p. [in Ukrainian].
5. Transforming our world: the 2030 Agenda for Sustainable Development (2015) Retrieved from https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E
6. Taranenko, I. (2000). Development of life competence and social integration: experience of European problems. Steps to competence and integration into society. K, Context, P. 37–40 [in Ukrainian].
7. Weizsaecker, E., Wijkman A (2018). Come On! Capitalism, Short-termism, Population and the Destruction of the Planet. Springer, 220 p.