

UDC 378.091.3:373.2.011.3-051]:[373.2.015.31:502]

DOI: 10.15587/2519-4984.2022.255307

## FORMATION OF ECOLOGICAL AND NATURAL COMPETENCIES OF CHILDREN OF PRESCHOOL AGE WITH THE HELP OF AN ECOLOGICAL PATH

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*In the method of formation of ecological and natural competence of a child the main aspect is the formation of an attitude to nature as a value, awareness of unity with the natural world, the formation of ecological knowledge, key among which are ideas about connections and dependencies in nature. The process of formation of ecological and natural competence affects all areas of development of the child's personality: intellectual, motivational, emotional and volitional, providing assistance to the full development of a preschooler in harmony with society and nature.*

*In the practice of environmental education, various approaches and methods of teaching directly in nature are increasingly used, one of which is an ecological path. Its purpose is to provide students with the opportunity to observe natural objects and phenomena, get acquainted with the most typical and unique natural landscapes, natural monuments, as well as characteristic manifestations of anthropogenic impact on the natural environment. An educational ecological path must be well equipped and informative. Each of its areas is a unique model that contains certain aspects of the environmental problem, natural knowledge.*

*Ecological paths are quite versatile and extremely effective. This is a unique form of not only environmental activities, but also recreation, associated with it. Therefore, children are willing to go on a prepared route - an ecological path to rest. They can be very diverse in scientific direction: zoological, botanical, geographical, geological, historical, and complex.*

*Ecological path is the most effective means of forming ecological competence, due to the fact that it synthesizes various forms and methods of acquainting preschool children with objects and phenomena of nature, children need to be taught to protect nature not only because it gives us something, but and because it is valuable.*

*In the course of the work an ascertaining and control experiment was carried out, as a result of which the effectiveness of the proposed system of measures for the formation of ecological and natural competence in older preschool children was introduced and tested. Based on the theoretical basis of the peculiarities of the formation of ecological and natural competence, three criteria of ecological and natural competence of older preschoolers are identified: cognition, emotionality, the presence of a behavioral component. According to the criteria, three levels of formation of ecological and natural competence of older preschool children are determined: low, medium and high.*

*Diagnosis was carried out in the process of observing the behavior of children on walks during play, work, in the process of classes, experimental research, conversations with children on natural and environmental issues.*

*During the study, methods were selected to diagnose the formation of ecological and natural competence of children. An ecological path was created on the territory of the preschool institution to expand the work on the formation of ecological and natural competence of preschool children. The results of the control phase of the study allow us to conclude that the work with the experimental group using routes along ecological paths has a positive impact on the level of knowledge and perception of environmental concepts, caring for children and the formation of ecological and natural competence*

**Keywords:** *preschooler, ecological consciousness, ecological thinking, ecological culture, ecological education of preschoolers*

### How to cite:

Volkova, L. (2022). Formation of ecological and natural competencies of children of preschool age with the help of an ecological path. ScienceRise: Pedagogical Education, 2 (47), 11–17. doi: <http://doi.org/10.15587/2519-4984.2022.255307>

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### 1. Introduction

At the stage of reforming education in Ukraine, raising a happy, healthy child has become especially important. According to the requirements of the Basic component of preschool education, by the end of the preschool period a child should be formed elements of

ecological worldview, ecological education, positive emotional and value attitude to nature [1]. Among the many areas of educational work with preschool children, environmental education is becoming increasingly important. The basis for the formation of a conscious attitude to nature is knowledge about it, self-awareness of

the active subject of nature, the subject of the world, in which a child lives. The problem of formation of ecological competence of preschool children became relevant when the public consciousness included an understanding of the relationship between human and nature, their interdependence and co-existence. However, the realities of modern life confirm that a significant part of the population of Ukraine has not yet formed environmentally sound behavior. Evidence of this is the dirt on the streets, littering of water bodies and their shores, irrational use of natural resources, emotional indifference of citizens to environmental problems, and, consequently, irresponsible attitude to their own health. The reason is not so much a lack of knowledge as a lack of proper attitude to nature, a sense of responsibility for nature as for their own living space, lack of awareness of the spiritual and physical unity of human and nature.

The last two decades are a period of formation of the ecological educational space. Scientists are working on technologies for teaching and educating children and youth, the search for effective methods of environmental education continues. Ecological upbringing of preschool children in the modernization of the preschool education system of Ukraine is declared in such basic state documents as the Law of Ukraine "On Preschool Education" [2], Basic component of preschool education (2021) [1], where the formation of ecological and natural competence of a child are determined as priority values.

## 2. Literary review

Environmental education has a lifelong impact [3]. However, researchers and practitioners of environmental education determine early childhood, which is defined as the age from birth to eight [4], as a particularly important period for the development of environmental literacy. Numerous studies have linked positive childhood experiences in nature with the emergence of environmental care in adults and participation in environmental behavior [5]. Ecological behavior was also studied [6], ecological consciousness [7], attitude to the environment [8] - begin to develop and form in early childhood.

Given the importance of early childhood in creating the basis of environmental sensitivity, interest and behavior in later life, environmental education at an early age is seen as a unique form of environmental education that influences the emergence of diverse approaches and philosophical orientations [9]. For example, nature-based programs for young children can provide a direct, nature-rich experience with goals, including the development of a basic assessment of the natural world [10].

Game learning focuses on pedagogical forms of EDEE, which expand the educational value of outdoor games [11].

Recent reviews of research related to the environmental education of preschool children have distinctions and limitations. According to the movement for nature-based education, some scholars [12] have studied the relationship of children with nature and/or contact with them, but did so given a wider age and range. In addition, these reviews focus on children and nature in general, including experiences, such as visiting green spaces or free games in neighboring parks and courtyards, rather than planned and/or structured programs.

In the ecological education of preschool children there is a technology of using landscape painting in the formation of aesthetic attitude to nature, created by G. Belenka and O. Polovina. Formation of aesthetic attitude to nature in preschoolers by means of fine arts involves the creation of a system of work, which includes: walks in nature to enrich emotional and sensory experiences, a series of classes of artistic and pedagogical communication on landscape paintings.

Based on the principles of competence and axiological approaches, implementing environmental education strategy, the task of developing emotional and value and responsible environmental attitude to the natural environment, which is manifested in nature-appropriate human behavior, is placed on the forefront [1].

At the heart of this transformation of approaches is a change in worldviews on the coexistence of human and the natural environment. In connection with the global general civilizational processes, characterized by significant deterioration of the ecological situation in the world, loss of ecological balance due to destructive human activities, the issue of educating people with ecocentric type of consciousness, which is able to build relationships with nature according to the laws of harmony, spiritual and cultural development, becomes urgent. The integration of natural and ecological components in the content of acquaintance of children with nature was inevitably reflected in the expected educational result - the formed natural and ecological competence of a preschooler, which determines the child's perception of nature as a whole organism, in which air, water, soil, plants, animals, people, Sun, Moon interact; the ability to distinguish between positive and negative effects of human activities on the state of nature; ability to arbitrarily regulate their own behavior in nature [1].

One of the most common in acquainting preschool children with nature is the environmental approach. Its main priority is environmental education of preschoolers - a process that combines environmental education, environmental upbringing, environmental development. This approach focuses on mastering the broad ecological content that forms the ecological consciousness of an individual - the ability to understand the relationships in natural habitats, predict the consequences of their violation, strive for environmentally sound activities in the natural environment [13].

The analysis of the scientific fund on the researched problem showed that the formation of ecological and natural competence of preschool children on an ecological path in Ukraine has not been studied comprehensively and systematically. At the same time, an ecological path, as a means of forming ecological and natural competence of older preschool children, has not previously been the subject of scientific research. Thus, ecological path is a unique form of environmental advocacy and a training laboratory in natural conditions.

## 3. Research aim and tasks

The aim of the study is to theoretically substantiate and experimentally test the effectiveness of the method of formation of ecological and natural competence of older preschool children by means of ecological path. To achieve this goal, the following tasks were set:

1. To carry out a theoretical analysis of the state of the research problem in the psychological and pedagogical literature.

2. To reveal the essence of the influence of an ecological path on the formation of ecological and natural competence of older preschool children.

3. To find out the level of formation of ecological and natural competence of children of senior preschool age in the conditions of preschool education institution.

4. To develop a method of formation of ecological and natural competence of children of senior preschool age by means of ecological path and to check its efficiency.

#### 4. Materials and methods

The object of research is the ecological education of older preschool children.

The subject of research is the method of formation of ecological and natural competence of older preschool children on an ecological path.

Research methods:

– theoretical: analysis, synthesis, induction, deduction, generalization, concretization, classification, modeling;

– empirical: ascertaining experiment, survey.

New technologies of ecological education are based on modern methods of formation of ecological ideas, among which:

– method of forming thought images – forming a system of ecological ideas on the basis of scientific information, works of art;

– method of ecological labitation – is the purposeful disorganization of certain aspects of personal worldview, resulting in psychological discomfort due to inconsistency of individual strategy of perception of nature and environmental activities to ingrained norms of coexistence of society and environment (for example, artificial introduction of garbage into a beautiful natural or photographic landscape and encouraging children to evaluate what they see);

– method of ecological associations – aimed at awakening associative connections between different images (penguins – kindergarten, forest – a multi-storey house for animals);

– method of artistic representation of natural objects - actualization of artistic components of reflection of the world of nature by means of art (use of painting, music, artistic word along with scientific information);

– method of ecological empathy – compassion for natural objects, appeal to the sensory sphere of personality; method of ecological reflection – analysis of human behavior in terms of natural objects (which is felt by a broken branch, which can tell about who broke it);

– game method – allows to learn in a natural form for a child about the world of nature and the rules of interaction with it in the process of performing roles and rules of the game. The following types of game learning situations are an effective means of forming ecological competence of preschool children: GLS with the involvement of toys, depicting objects of nature; GLS with the use of puppets of fairy tale characters, the plot of which is related to nature; GLS travel ("tourist trip", "excursion to the flower exhibition").

A modern educator conducts classes on nature admiration, research classes, discovery classes, travel classes, dream classes, in which children are given the opportunity to share their feelings, independently, but under the guidance of an educator to acquire knowledge, dream. It is desirable, that they take place in the bosom of nature, with the use of music, fine arts, labor.

Thematic classes are effective in working with preschoolers. The purpose of these classes in nature: to look and notice, to notice, to witness, to feel and think, to think and act. Preference is given to the inductive method of cognitive activity. First, children receive information through observations, experimentation, didactic games, work, and only then are the final classes, which establish cause-and-effect relationships, draw conclusions.

In working with children, problem situations that stimulate curiosity are used. In the content of problem situations, such techniques as giving children the variability of signs of the same objects and phenomena; comparison and juxtaposition of new characteristics with known ones, combination of artistic description of objects and phenomena of nature with their real features through direct perception are used.

The structure of the experiment has much in common with observation. But the process itself requires special equipment and conditions. During the experiment there are four stages.

The first stage is the preparation of children for exploratory activities in nature. This stage should be aimed at identifying children's knowledge of certain objects and natural phenomena and creating an atmosphere of interest. Appropriate questions, an interesting story of an adult or a reading of a work of art will help to prepare children for search activities in nature. For example, when children play with balloons, you can ask: "Do you think that if you put a pebble in a pot with soil, it will grow? And a bean?"

The second stage is the beginning of the experiment. It begins with making assumptions. If children have the necessary knowledge, they can make assumptions in the form of certain statements. If the assumptions are correct, the adult should confirm them experimentally. False assumptions must be refuted. To do this, discuss the conditions of the experiment. All of them must be the same, except one to ensure the "purity" of the experiment. For example, to check if a pebble will grow, you need to plant a seed in one pot and a pebble in another. Pots should be the same for all parameters: color, shape, size. The conditions of care for both objects of nature should be the same: watering, loosening the soil, lighting.

The third stage is the course of the experiment and further exchange of views.

The fourth stage is the final one, during which the obtained result is discussed and certain conclusions are made. The initial assumptions are confirmed or refuted.

An important form of environmental education and promotion of environmental measures is the creation of educational environmental paths. The creation of an ecological path begins with the production of a map-scheme of the territory of the PEI, the development of the route, the definition of possible thematic areas, as well as stands and signs, their location, warning signs.

The experiment involved 22 children from the senior group No. 11 (Experimental group) and 23 children from the senior group No. 10 (Control group), a total of 45 older preschool children.

The ascertaining research includes the development of criteria and indicators of formation of ecological and natural competence of children of senior preschool age; the development of methods for diagnosing ecological and natural competence of older preschool children; the implementation of quantitative and qualitative analysis of the obtained data. The control study includes the determination of the dynamics of changes that occurred in the process of formation of ecological and natural competence of older preschool children on an ecological path; the implementation of a comparative analysis of the formation of ecological and natural competence of older preschool children in experimental and control groups after the ascertaining study.

Based on the theoretical basis of the peculiarities of the formation of ecological and natural competence, three criteria of ecological and natural competence of senior preschoolers are identified: cognition, emotionality, the presence of a behavioral component. According to the criteria, three levels of formation of ecological and natural competence of senior preschoolers were determined: high, medium and low. To conduct a research to form ecological and natural competence of preschoolers, parents agreed to conduct the study.

### 5. Research results and discussion

In the method of formation of ecological and natural competence of a child the central aspect is the formation of an attitude to nature as a value, awareness of unity with the natural world, the formation of ecologically coordinated activities in nature on the basis of ecological and natural knowledge, key among which are ideas about connections and dependencies in nature. The pro-

cess of formation of ecological and natural competence affects all areas of development of the child's personality: intellectual, motivational, emotional and volitional, providing assistance to the full development of a preschooler in harmony with society and nature.

In the practice of environmental education, various approaches and methods of teaching directly in nature are increasingly used, one of which is an ecological path. Its purpose is to provide students with the opportunity to observe natural objects and phenomena, get acquainted with the most typical and unique natural landscapes, natural monuments, as well as characteristic manifestations of anthropogenic impact on the natural environment. The ecological training path must be well equipped and informative. Each of its areas is a unique model that contains certain aspects of environmental problems, natural knowledge.

Ecological paths are versatile and extremely effective. This is a unique form of not only environmental activities, but also recreation, associated with it. Therefore, children go on a prepared route – an ecological path to rest. They can be more diverse in scientific direction; zoological, botanical, geographical, geological, historical, and complex.

Ecological path is the most effective means of forming ecological competence, due to the fact that it synthesizes various forms and methods of acquainting preschool children with objects and phenomena of nature, it is necessary to teach children to protect nature not only because it gives us something, but and because it is valuable.

Based on the theoretical basis of the peculiarities of the formation of ecological and natural competence, three criteria of ecological and natural competence of older preschoolers are identified: cognition, emotionality, the presence of a behavioral component – and relevant indicators, the essence of which is shown in Table 1.

Table 1

Criteria and indicators of ecological and natural competence

Criteria	Indicators
Cognition	What a child knows about nature, what is good for it and what is bad
Emotionality	Like – dislike, interested – not interested
Behavioral component	The child's understanding that life in any form of its existence depends on his/her behavior

According to the criteria, three levels of formation of ecological and natural competence of senior preschoolers are determined: high, medium and low (Table 2).

To study the level of formation of ecological and natural competence of children according to each criterion, according to the method of G. Belenka [15], selected diagnostic methods, containing different types of didactic tasks that correspond to the content of education "Nature

of Earth", educational line "Child in the natural environment" of BCPE. The survey result is presented in Table 3.

Methods of formation of ecological and natural competence on an ecological path are presented in Table 4.

Checking the effectiveness of the proposed method of forming the ecological and natural competence of older preschool children on an ecological trail (control experiment) is shown in Table 5.

Table 2

## Requirements for levels of research behavior of ecological and natural competence

levels of research behavior	Number of points	Requirements for levels of research behavior
High	56–72 points	Has an idea of the natural environment of the Earth and the Universe as a whole organism, in which air, water, soil, plants, animals, people, the Sun, the Moon interact; realizes the importance for human activity, for him/herself; perceives nature as a value, distinguishes the positive and negative impact of human activity on the state of nature, arbitrarily regulates his/her own behavior in nature; realizes him/herself part of the great world of nature; knows about the dependence of one's own health, mood, activity on the state of nature, its diversity and beauty; shows interest, desires and possible skills in relation to environmental actions; makes moderate efforts to preserve, care for and protect the natural environment.
Middle	40–55 points	Has an idea of the natural environment of the Earth and the Universe, in which air, water, soil, plants, animals, people, the Sun, the Moon, etc. interact; perceives nature as a value, arbitrarily regulates his/her own behavior in nature; realizes him/herself part of the great world of nature; shows interest, desires and possible skills in relation to environmental actions; makes moderate efforts to preserve the natural environment.
Low	24–39 points	Has basic ideas about the natural environment of the Earth and the Universe, about air, water, soil, plants, animals, people, the Sun, the Moon, etc.; determines their significance for human activity, for themselves; perception of nature is unstable, does not realize him/herself part of nature; does not know about the dependence of own life on nature

Table 3

## Results of the formation of ecological and natural competence in older preschool children

Levels	Experimental group (EG)		Control group (CG)	
	Abs.	%	Abs.	%
High	5	11	6	25
Middle	7	37	8	33
Low	10	52	9	42
Totally	22	100	23	100

Table 4

## Stages of methods of formation of ecological and natural competence of children of senior preschool age on an ecological path

Work stage	Work content	Aim	Educator's role
I stage Cognitive-emotional	1. Integrated and complex classes	To provide children with specific knowledge and ideas about nature	To explain the purpose and content of the lesson
	2. Ecological and educational games	Formation of children's positive attitude to the natural environment	To explain the content and rules of the game
	3. Emotional and aesthetic perception of nature	Development of aesthetic and humane feelings of nature.	To encourage a child to want to act in accordance with the rules of nature.
II stage: Activity-volitional	1. Walks along the route of an ecological path.	Educating children in responsible activities and behavior in the natural environment.	To explain the content and rules of responsible behavior in nature, to encourage a child
	2. Search and research activities.	Development of the ability to be responsible for the consequences of behavior in nature	Demonstration and explanation. An educator shows and explains what needs to be done
	3. Environmental activities	Learning the rules of nature and their observance.	To explain why and how to protect nature
Work stage	Work content	Aim	Educator's role
III stage Conscious-creative	1. Gaming activities	To establish rules of conduct in the natural environment	Explanation, reminder, approval, encouragement.
	2. Artistic activities	Learning the creative realization of the acquired knowledge about nature.	To encourage a child. Give children an opportunity to work independently
	3. Labor activities	Education of independence in the performance of work assignments in nature.	An educator monitors the actions of a child, notes the diligence of the child. Self-esteem of labor

Table 5

Results of the formation of ecological and natural competence in older preschool children on an ecological path

Levels	Experimental group (EG)		Control group (CG)	
	Abs.	%	Abs.	%
High	7	32	6	25
Middle	9	41	8	33
Low	6	27	9	42
Levels	Experimental group (EG)		Control group (CG)	
	Abs.	%	Abs.	%
Totally	22	100	23	100

Comparing the results of the study in the experimental group of children before and after the work, we can say that the level of environmental competence in preschool children has increased. These studies are graphically depicted in Fig.1.

As can be seen from Fig. 1, the difference between the preliminary and final data, obtained in the experimental and control groups, is quite significant. This testifies to the effectiveness of the work, carried

out on the formation of ecological and natural competence of older preschool children on an ecological path.

Ecological path is a mandatory element of the ecological and developmental subject environment of preschoolers. After all, it provides an opportunity to acquaint children with the environment on the basis of direct contact, involving them in special types of practical activities.

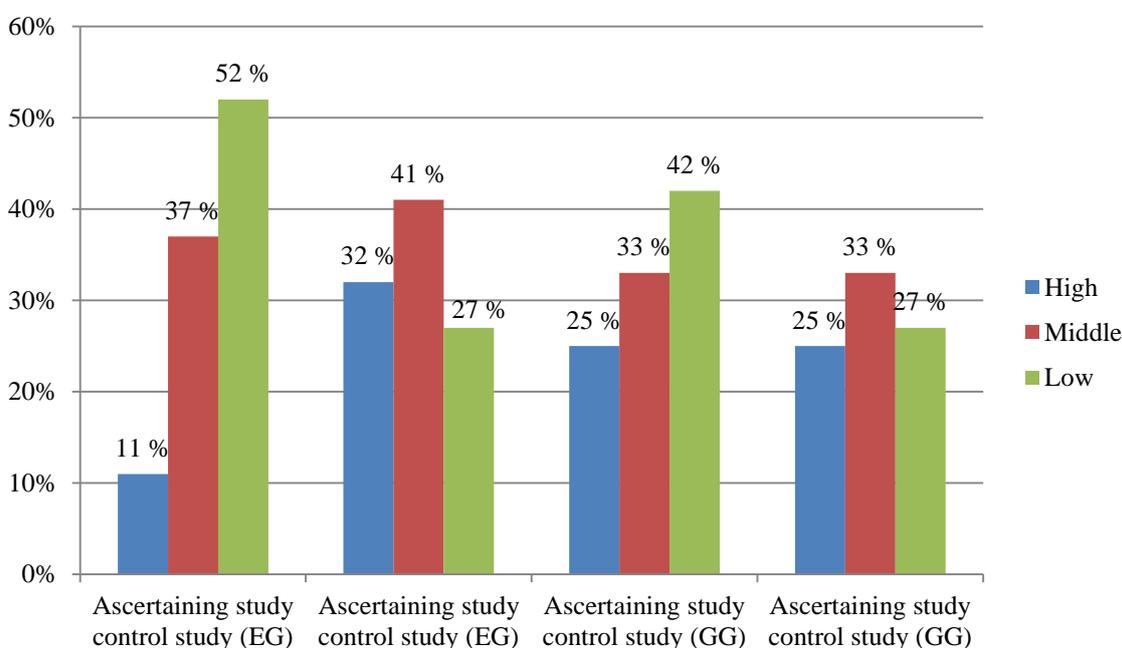


Fig. 1. Results of the repeated research of formation of ecological and natural competence at children of senior preschool age

The diagnosis was carried out in the process of observing the behavior of children on walks during play, work, in the process of classes, experimental research, conversations with children on environmental issues.

The study does not cover all aspects of the research problem. Further study requires the search for new methods of forming a nature conservation worldview, nature conservation behavior of preschool children. Prospects for further research are the further formation of ecological and natural competence of older preschool children to improve the level of formation of ecological and natural competence of preschoolers. Further development requires features of the formation of environmental competence in the system of professional development of educators.

## 6. Conclusions

1. The central aspect of the method of formation of ecological and natural competence of a child is the formation of an attitude to nature as a value, awareness of unity with the natural world, the formation of ecologically coordinated activities in nature. The process of formation of ecological and natural competence affects all areas of development of the child's personality: intellectual, motivational, emotional and volitional, providing assistance to the full development of a preschooler in harmony with society and nature.

2. A necessary element of the ecological developmental subject environment of a preschool educational institution is an ecological path, ie a route that passes through various natural objects of aesthetic and environmental value, on which travelers receive both oral and

written information (posters) about objects. The created ecological path will promote children's health, their cognitive, ecological and aesthetic education, development of moral qualities and competent balanced behavior in the environment, as well as: ecological education of teachers and parents.

3. Based on the theoretical basis of the peculiarities of the formation of ecological and natural competence, three criteria of ecological and natural competence of preschoolers are defined: cognition, emotionality, the presence of a behavioral component. According to the criteria identified three levels of ecological and natural competence of preschool children: high, medium and low.

4. During the study, methods were selected to diagnose the formation of ecological and natural competence of children. In order to expand the work on the formation of ecological and natural competence of preschool children on the territory of PEI, an ecological path was created. Ecological path is a unique form of combining recreation and environmental advocacy. The results of the study indicate a positive impact on the level of knowledge and perception of environmental concepts, caring for the environment by children and the formation of their ecological and natural competence

#### Conflict of interest

The authors declare no conflict of interests.

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*Received date 20.04.2022*

*Accepted date 20.05.2022*

*Published date 31.05.2022*

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