

# Assessment of Ecological Consciousness Formation among Adolescent Girls in the Learning Process by Means of Specialized Computer Systems

**Irina B. Kostina, Yuliya P. Gladkikh, Maxim A. Velichko, Lyudmila V. Krasovskaya, Olga N. Satler**

**Abstract:** The article discusses the results of empirical research in the framework of ascertaining experiment, the purpose of which was to assess the level of environmental consciousness formation of the secondary school adolescent girls. The results analysis was carried out on the intensity levels of subjective relations, such as: perceptive-affective, cognitive and behavioral. To diagnose each component the technique of "Naturafile" was used, which helped to identify the nature of development level of ecological consciousness. Information processing within the framework of the expected results evaluation criterion was carried out on the basis of mathematical statistics methods included in the data analysis package of MS Excel software application. Significant differences in the studied parameters between the groups were revealed by the determination coefficient.

**Index Terms:** ecology, ecological consciousness, ecological worldview, ecological education.

## I. INTRODUCTION

The external environment is everything that surrounds us that is the source of our life – earth, water, sky, sun and all the creatures that live in the world with us. And we must admit that today this whole vast and diverse world is experiencing the devastating impact of human activity. In the name of civilization and technological progress, creating comfort and convenience for ourselves, we have so thoughtlessly plundered nature, so barbarously violated its balance that in the end, we have created the environment harmful to ourselves.

The severe consequences of environmental pollution are already evident. Diseases associated with industrial emissions are now common not only to citizens, but also in rural areas. Significantly more often there are allergic reactions associated with intolerance to different substances and there is no doubt that the reduction of natural immunity in children and adults is also associated with adverse external influences. Modern man poorly resists even the most

common, usually considered little-aggressive microbes. It is obvious that thoughtless environmental policy is particularly harmful to children, the vulnerable victims of the environment. And this is manifested in the fact that the child has to live in unhealthy rooms, drink unhealthy water and eat unhealthy products. Many diseases that children did not know before have become frequent.

Cancers in children, for example, twenty years ago were rare, and now it is one of the main serious pathologies and the main causes of death before the age of 14 years. And now we are all concerned about the question – what will happen to our planet next? What will happen to us and our children? The dangers that people have created for the environment have become a danger to the person. These are the realities of modern society. However, it will be possible to suspend this process only when every inhabitant of the planet is aware of the seriousness of the unfavorable ecological situation on Earth and will do everything possible to improve it. Under these conditions, the role of women and their psychological characteristics in environmental practice, which, unfortunately, have not been sufficiently investigated, is significantly actualized. In fact, only women, the most interested people who feel responsible for the deterioration of the living space of their children (and their own). They, as future mothers, actively oppose the mindless tendency of clogging everything around, against the illusion of reliability, convenience, cheapness of nuclear energy, against everything that leads to water pollution, which is why the forests die and lose their charm of the meadow. As rightly observed I.V. Lovygina "...the environmental consciousness of women can be defined as a standard and a sample" [1]. Today there is no doubt that the process of ecological consciousness formation of the younger generation depends on the General culture of the population and goes through several stages, in particular:

1. The first stage comes in childhood, children get acquainted with the surrounding world, the environment of their residence. At this stage, a woman as mother should instill in her child the simplest environmental values, for example "...do not push the bug, it hurts" or "...do not tear the leaf, or it will cry". In such a simple form, she can instill love to nature in her child,

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show its place in the world and the relationship of all its components, thereby explaining that the earth brings good to man, if you take care of it [2].

2. The second stage plays a very important role in the formation of ecological consciousness, the basis of which is education and upbringing at school. It is during this period that the further life foundations of the individual and its attitude to the world around him are laid. School teachers play crucial role in this task. As V. O. Korunova correctly notes, "... the basis for the formation of this task is the corresponding value ideas about the nature and place of man in it" [3].

3. The third and final stage of the process of the modern man's ecological worldview formation includes subjective-value relations to nature, the general culture of the population and the development of new vectors of its strategic evolution in various fields of science and education. Consideration of the stages of ecological consciousness formation allows us to distinguish the second stage, since the aspects of ecological education are based on "the search for the most sensitive aspects of the student's personality, effectively reacting to pedagogical techniques and bringing positive results in a change in attitude to nature" [4].

## **II. MATERIALS AND METHODS**

The study was conducted in the framework of the ascertaining experiment on the basis of the municipal budget educational institution "Secondary school № 37" Belgorod, which was attended by students of 5-10 specialized classes in the amount of 250 people. Girls are 10-15 years old. Duration of the study is November-April 2017-2018.

Diagnostic tools were interview, questionnaires, tests on science subjects and integrative subjects, as well as diagnostic methods "Naturapil", which was designed to determine the intensity of subjective relations in the interaction with natural objects and phenomena. The method of assessing of the girls' ecological consciousness development of was evaluated on such levels as sensory-emotional, rational and behavioral-volitional.

When choosing methods and techniques, we took into account their reliability, clarity and suitability for group surveys, as well as the probability of processing the results using mathematical and statistical methods.

Processing of information within the criterion of the expected results evaluation: assessment of the level of development of the schoolgirls' environmental consciousness, was carried out on the basis of methods of mathematical statistics included in the package of data analysis of MS Excel software application. To determine the extent to which environmental knowledge depends on a student's belonging to a particular group, and to identify differences between the subjects, a correlation coefficient called the determination coefficient was used.

## **III. RESULTS AND DISCUSSION**

The assessment of the level of formation of ecological consciousness of teenage girls took place in several stages. At

the first stage, we had a conversation with teachers and students, during which we found out that the work on the development of environmental thinking was carried out within the information part, in particular: circles, environmental lectures and meetings, special lessons within the classroom hours, etc. At the second stage, students' knowledge of environmental problems at the local, regional and global level was determined. In the questionnaires submitted to the schoolgirls, there were questions of the following nature:

1. How aware are you of the environmental problems of your city, region and country as a whole? Regardless of the class (group) profile, all the girls responded positively.

2. What feelings overwhelm you at the sight of dirty streets, squares, parks, reserves, etc.

In comparison with the answer to the first question, the opinion of the students was divided: a) most of the teenagers expressed their dissatisfaction and aggressive statements to those who relate self-centered to the environment; b) this group of teenagers responded ambiguously, that is, they are aware of environmental problems, but do not find a way out of the problem situation; c) the third group responded constructively, without aggression. Their answers were something like this: Do not tear the roses from the bush, I'd better pick them myself.

According to the results of the survey, we concluded that the girls are aware of the environmental situation in their region and the country as a whole.

The third stage of our experiment was to determine the level of the students's environmental consciousness of different age groups studying in classes with different profiles by means of subjective attitude to nature. A basic component to the study of subjective relations has become a diagnostic technique called "Naturapil", developed by S. D. Derjabo and V. J. Jasvin [5]. The questionnaire is aimed at the diagnosis of various aspects of the intensity level of subjective attitude to nature, as well as the study of naturalistic erudition of personality characteristics. It includes four main scales commensurate with the four components of intensity: perceptual – affective, cognitive, practical and translational, as well as an additional scale of naturalistic erudition, and is designed so that it is possible to anticipate the behavior of the individual in different situations.

According to the results of diagnostic studies of subjective attitude to natural objects, all teenagers who agreed to pass the test were divided into three groups. The first group of 170 people (68 %) from the total sample of the studied girls showed a high level of perceptive-affective component.

The change in the perceptive-affective component of the intensity of the attitude to nature is explained by the fact that in adolescence the emotional background becomes uneven, unstable. Typically, when the child grows up, his life was other important values, such as friends, bosses, idols, different hobbies, etc. than the love of natural objects. The second group consisted of adolescent girls, whose dominant motive is learning and,



accordingly, having high rates of cognitive component of attitude to the world. This group included 55 people (22%) of the total sample of subjects. It is important to note that in this group of teenage girls there is a need for new knowledge, curiosity, which encourages them to learn and receive scientific information about nature in any form. In addition, for this category of adolescents, natural phenomena and objects are a source of environmental knowledge aimed at acquiring new and meaningful information that requires critical processing of cognitive scientific information. It is during this period that children have a need for active, independent creative knowledge. In principle, it can be implemented in training activities. Slightly lower rates were recorded in adolescent girls aged 10-11 years, due to the fact that the younger adolescence is sensitive to the transition to self-study. The lowest rate have schoolgirls of 14-15 years, they usually acquires the most primitive form of hobbies - informative and communicative. They manifest a thirst for new, not too informative information that does not require

any critical processing, and the need for easy communication with peers. The third group consisted of adolescent girls with a pronounced behavioral component. It included 25 people (10%) from the total sample of the studied. In the third group of the surveyed, the following indicators were revealed: in adolescent girls aged 10-11 years, the average score was 21.5; 12-13 years-26.47; 14-15 years 20.

Note that the third group of teenage girls is characterized by the fact that perceives nature as an object of practical use. They do not cause any nature of emotions, there is no cognitive interest in its objects and phenomena, which are the source of scientific knowledge. In fact, this group of teenagers is dominated by the type of environmental consciousness. This suggests that this group is manifested consumer relations to the natural environment, thus it has a high rate of behavioral component.

After all the statistical characteristics were determined, we made calculations and found the correlation ratio. The calculation results are shown in table 1.

**Table 1.** Correlation analysis of indicators of inter-group and intra-group dispersion, as well as the coefficient of determination

Class profile (group)	The average score in the group ( $\bar{x}_i$ )	Number of group, people ( $n_i$ )	Group dispersion (D)	Inter-group dispersion (Dinter)	Average score of all subjects ( $\bar{x}$ )	Intra-group dispersion ( $D_{intra}$ )	Coefficient of determination ( $\eta^2$ )
General education	93.58	151	244.58	48652.84	278.89	494.79	0.99
Natural-science	131.64	99	230.64				

We found the coefficient of determination, which shows that the success of the development of components of environmental consciousness in this experience is 99% due to the belonging of the student to a particular group.

## I. CONCLUSION

Based on the above concept in our study, it must be said that the huge role in formation of ecological consciousness of girls and later women is played by an educational institution, where the environmental culture in the context of the system of social relations, social and individual ethical norms, beliefs, attitudes and moral values relating to the relationship between man and nature, acquire special significance. Within the school age, girls perceive environmental aspects, directly or indirectly communicated to them by parents or teachers, thus developing the main trends in the moral and moral qualities of the individual. Even short indirect communication with nature ennobles and illuminates every

person. According to M.N. Markova, an environmentally cultural person in the knowledge of nature and communicating with it through his feelings (admiration, joy, surprise, affection, anger, indignation, compassion) experiences his attitude to it and seeks to preserve the wild nature, thereby showing love for the world of nature" [6]. Such studies could not only assess the value of environmental consciousness at the level of age trends, but also show particularly positive or negative changes in personality [7]. Therefore, "education should be filled with environmental knowledge, based on environmental values" [8]-[9] not only in classes with a natural science profile, but also in classes based on the traditional program. Environmental knowledge should be presented as a way of life of modern society [10]-[15]. And, of course, an important role is played by the environmental consciousness of women, which, being transformed into

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environmental knowledge and actions is formed from childhood and continues all the next time, where the secondary school should lay the Foundation for an environmentally-moral personality.

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