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ФОРМИРОВАНИЕ ЭКОЛОГИЧЕСКОГО СОЗНАНИЯ СТУДЕНТОВ РОССИЙСКИХ УНИВЕРСИТЕТОВ КАК ОСНОВА РЕШЕНИЯ ПРОБЛЕМ УСТОЙЧИВОГО РАЗВИТИЯ

Целью нашего исследования является научно-теоретическое рассмотрение особенностей субъективного отношения студентов к окружающей среде, диагностика у них уровня развития интенсивности, определения типа субъективного отношения и типа доминирующей установки к природе, а также разработка педагогических методик по формированию экологического сознания студентов университета. В качестве основы для разработки методики повышения уровня экологического сознания студентов университета мы взяли творческие задания, основанные на теории сотворческих рефлексивных технологий, разработанной и предложенной С. Ю. Степановым. Применение данной методики на практике показало её эффективность в формировании экологического сознания студентов (p ≤ 0,05 – 0,01).

Ключевые слова: экологическая культура, экологическое сознание, студенты вуза, компоненты экологического сознания, субъективное отношение к природе

A. Fortunatov

ANSWERING CHALLENGES OF SUSTAINABLE DEVELOPMENT: THE DEVELOPMENT OF ENVIRONMENTAL AWARENESS IN RUSSIAN UNIVERSITY STUDENTS

The reported study aimed to determine the type and level of university students' subjective attitudes to nature, to identify the types of predominant environmental mindset, and to develop educational tools to facilitate the development of environmental awareness in students. The study revealed that most respondents had an anthropocentric type of environmental awareness with the predominant perceptual-affective type of attitude to nature. To raise environmental awareness in students, we propose a technique based on the creative tasks of S. Yu. Stepanov's theory of co-creative reflexive technologies. Applied in practice, the technique proved effective in developing environmental awareness in students (p ≤ 0.05 – 0.01).

Keywords: environmental culture, environmental awareness, university students, components of environmental awareness, subjective attitude to nature.

Introduction

Today, environmental challenges are of global concern and impact all aspects of human-nature interaction. Scientific and technological advances have long been playing a crucial role in the aggravation of environmental issues. This development path chosen by human civilization and its impact on the natural environment has led to predictable consequences reflected in the 17 goals identified by the UN in the field of sustainable development (Sustainable Development Goals, n.d.). The goals include combating climate change, conservation of marine and terrestrial ecosystems, responsible consumption and production, etc. In order to achieve these goals, it is necessary to address a number of challenges concerning the development of environmental awareness

and culture in the younger generation [5; 13; 14; 16].

Speaking about the context in which modern civilization is developing, we need to emphasize that the contemporary society is going through a crisis of moral values, which inevitably results in many environmental issues. Thus, the solution of environmental issues goes hand in hand with ethics education and the development of environmental awareness [4; 17].

We share the opinion of Yu. V. Pushkarev who highlights an urgent need to change people's attitude to socionatural environment. This can be achieved by raising public awareness of environmental issues, the transformation of environmental attitudes and guidelines that serve as the foundation of an individual's ecological thinking [9].

The analysis of psychological and pedagogical literature focusing on the development of environmental awareness in students has shown that the issue has not been given the attention it deserves. Most studies focus on the development of environmental competence in university students [1; 2; 3; 8; 10]. However, we believe that the development of environmental awareness in the younger generation is by far the most important task on today's educational agenda [5].

Global environmental problems identified in the 21st century have been proven impossible to solve single-handedly, which is why the development of environmental culture and consciousness of the younger generation has acquired such significance for humanity [15]. However, modern environmental education does not contribute enough to the reduction of human-induced destructive practices. We share the opinion of I. Niankara, D. T. Zoungrana, L. Briggs et al., who point out that the current level of university students' interest in conservation of the natural environment is quite low [1; 7].

Therefore, the purpose of this study was to investigate the typology of university students' subjective attitude to nature and develop a methodology based on co-creative tasks to facilitate the development of environmental awareness in students.

We based our study on S. Yu. Stepanov's approach to co-creative reflexive technologies, which, as the author points out, is distinguished by the consistent implementation of humanistic axiology and reflexive methodology to solve the most pressing issues of modern education [11].

Of particular interest is also V. A. Yasvin's research where he identifies constituent components of environmental culture [18] and the works by A. A. Fortunatov and V. L. Benin [5] exploring the issues and components of environmental awareness. The analysis of the above studies returned the following components in the structure of environmental awareness: a set of ideas and knowledge (both individual and collective) about human-nature interaction, the nature *pers se* and environmental activities. Based on these components, we selected the diagnostic techniques for the development of environmental awareness in university students.

Materials and methods

We hypothesized that using tasks based on co-creative reflexive technologies in teaching students with a low level of environmental awareness will result in its increase. The hypothesis was based on S. Yu. Stepanov's studies [11] which demonstrate high effectiveness of co-creative reflexive technologies as regards the development of a student's personality.

The study was conducted at Moscow University for the Humanities and Moscow City University in the 2020-2021 academic year. The study involved 150 full-time and part-time students aged 18 to 30. Among them, 90 are the students of the Institute of Digital Education (Moscow City University) and 60 study at the Department of Advertising, Journalism, Psychology and Art (Moscow University for the Humanities).

The diagnostic assessment was based on two tools developed by S. D. Deryabo and V. A. Yasvin [19]: the Naturophile tool used to determine the level and the type of students'

subjective attitude to nature, and the AESOP word-association environmental mindset diagnostic assessment tool (the original name of the technique consists of the initial letters of the Russian words for *emotions*, *knowledge*, *protection* and *benefit*). The latter was used to determine the type of the predominant mindsets regarding nature. Both tools were chosen for their statistical reliability demonstrated by their developers and for their complementary nature.

The Naturophile tool has four scales that correspond to four theoretical components of the level of subjective attitude to nature: perceptual-affective, cognitive, practical, and behavioral. In this study, it was supplemented with a scale of general knowledge about natural environment. High level of environmental awareness implies the predominance of the behavioral type combined with low values of the practical component.

The AESOP word-association diagnostic assessment tool proposes four types of environmental mindsets depending on whether an individual perceives nature as a source of beauty (aesthetic mindset); as an object of study or source of knowledge (cognitive mindset); as an object of protection (ethical mindset); or as a source of benefit (pragmatic mindset).

Our experimental study consisted of three stages: initial, developmental and control. At the initial stage of the study, we determined the type of the students' subjective attitude to nature using the Naturophile and AESOP tools. At the developmental stage, we employed creative tasks based on the theory of co-creative reflexive technologies proposed by S. Yu. Stepanov. At the control stage, we used the Naturophile and AESOP tools again to identify changes in the students' subjective attitude to nature.

The following methods were selected for statistical data processing: primary statistical data processing (average frequencies), Student's *t*-test and the sign test to assess the significance of differences between the average values of the components of environmental awareness of university students in different groups.

Results

The study aimed to explore environmental awareness in students as future agents of policy-making in the field of natural environment. Whether the planet Earth is preserved for future generations depends on how effectively we can develop environmental culture and awareness in the present-day younger generation.

Let us first consider the data obtained with the Naturophile tool. The study revealed that the predominant subjective attitude to nature in students is perceptual-affective (51%). This type of attitude implies a keen interest in nature's beauty, i.e., aesthetic pleasure the person gets from its most beautiful and attractive elements. This entails a high susceptibility of such students to material elements of the natural environment. At the same time, other elements of the environment may be of lower value due to their low attractiveness, which, in our opinion, may affect the quality of interaction with the natural environment (see Fig. 1).

The practical type of attitude to the natural world was identified in 11% of those surveyed. This type of attitude implies that the individual sees nature exclusively as a provider of resources essential for satisfying his or her vital needs, i.e., here we deal with a pragmatic and practical attitude to the natural environment. We can state with confidence that students with this kind of worldview have a pronounced anthropocentric type of environmental awareness (see Fig. 1).

In our sample, a cognitive type of subjective attitude to nature was found in 4% of cases. This attitude is marked by an increased interest in any information that explains the laws of nature. It is also in line with Sustainable Development Goal 4 that aims to ensure quality education and promote life-long learning opportunities. In our case, a low percentage of respondents with a cognitive attitude indicates that students have a low level of readiness and desire to obtain information about the natural environment. Besides, the majority of them have no interest in the preservation of nature (see Fig. 1).
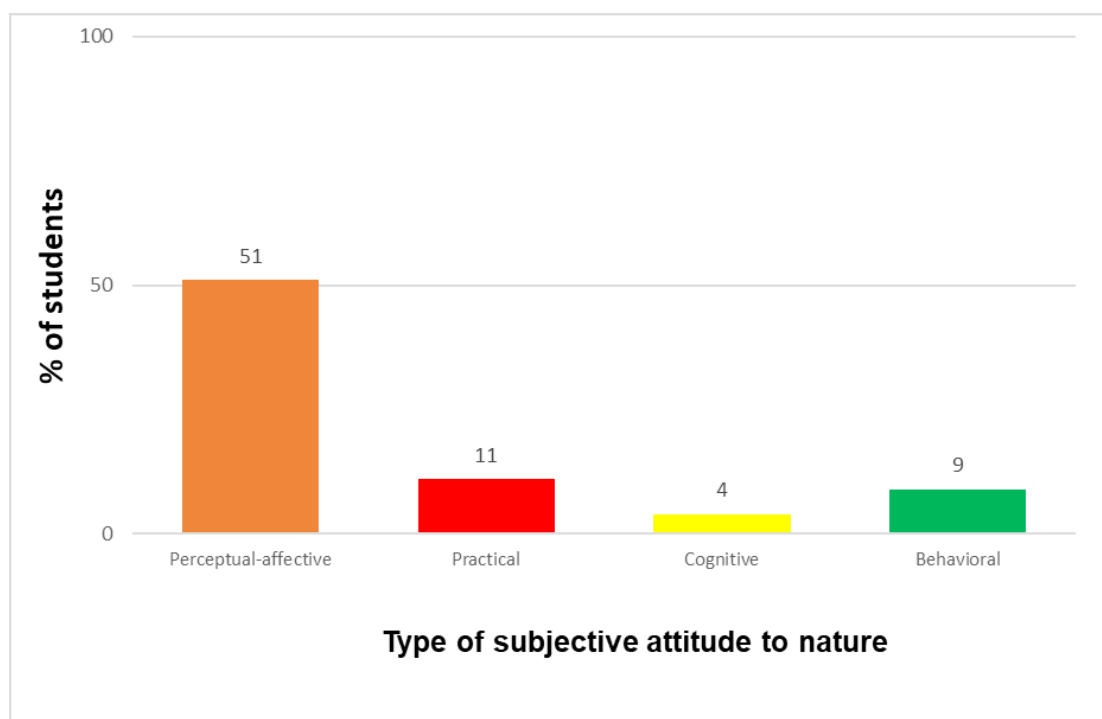
Fig. 1. Environmental awareness of students (the Naturophile tool)

The behavioral type was identified in 9% of the respondents. Importantly, it is this type that is associated with a high level of environmental awareness (see Fig. 2). People with this type of attitude perceive the natural environment as a thing of value, something they would never do any harm to. People with the prevailing behavioral attitude actively engage in eco-friendly movements and environmental protection activities. They are also active in engaging others to follow their path. In our opinion, this type of attitude contributes best to the implementation of Sustainable Development Goals, namely, transition to rational consumption of natural resources, environmental sustainability of human settlements, implementation of measures to combat climate change on the planet Earth, conservation and rational use of water resources, etc.

According to the majority of environmental scientists, to preserve the natural environment for future generations, the modern generation needs a transition from the perceptual-affective to the behavioral type of subjective attitude to nature. However, it should be noted that a high level of knowledge in the field of ecology, unless it is coupled with subjective (value-based) perception of the natural environment, results in indifference.

We also obtained the following data on the perceptual-affective-practical (16%), perceptual-affective-behavioral (6%) and practical-behavioral (3%) types of attitude to nature (see Fig. 2).

Similar data were obtained with the AESOP tool that assessed environmental mindsets of students.

The study revealed the predominance of students with an aesthetic mindset regarding the natural environment (62%), which means that in most cases their nature-related activities have an aesthetic character. Such activities include visiting favorite places in city parks, browsing the photos of animals and plants on social networks, going camping, etc. This kind of mindset is closely related to the perceptual-affective type of subjective attitude to nature singled out by the Naturophile tool. As we noted earlier, this mindset is situational and is only related to the places that, for one reason or another, make students experience aesthetic pleasure (see Fig. 3).
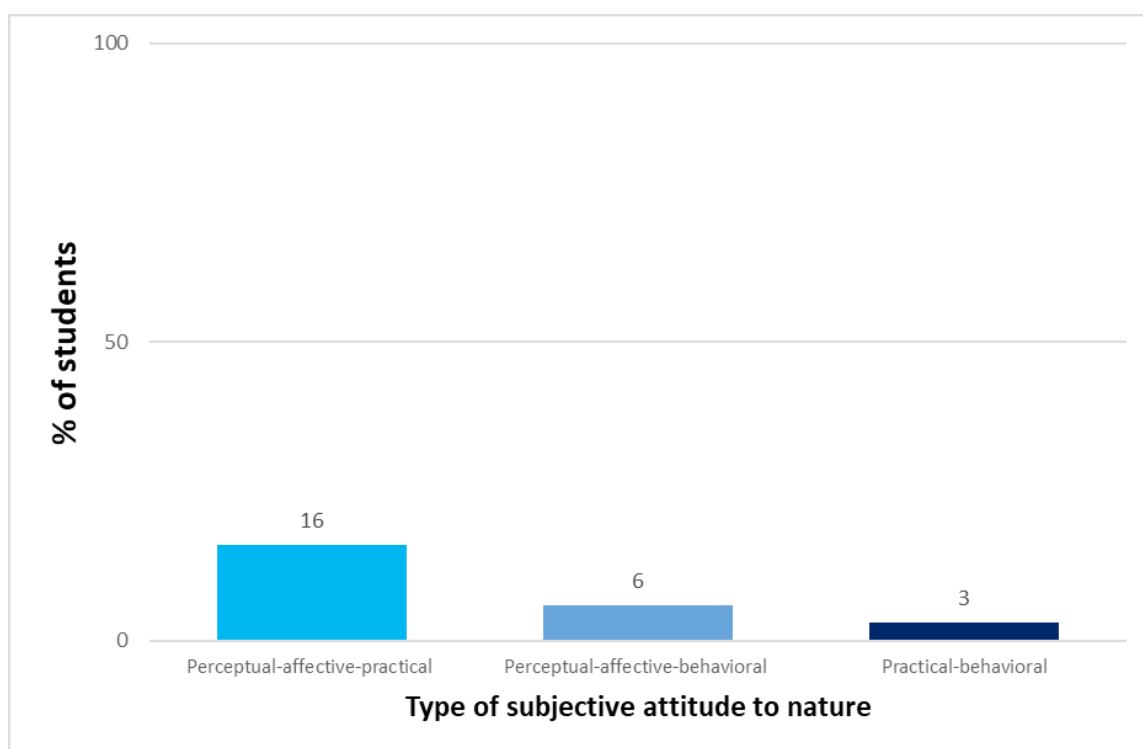
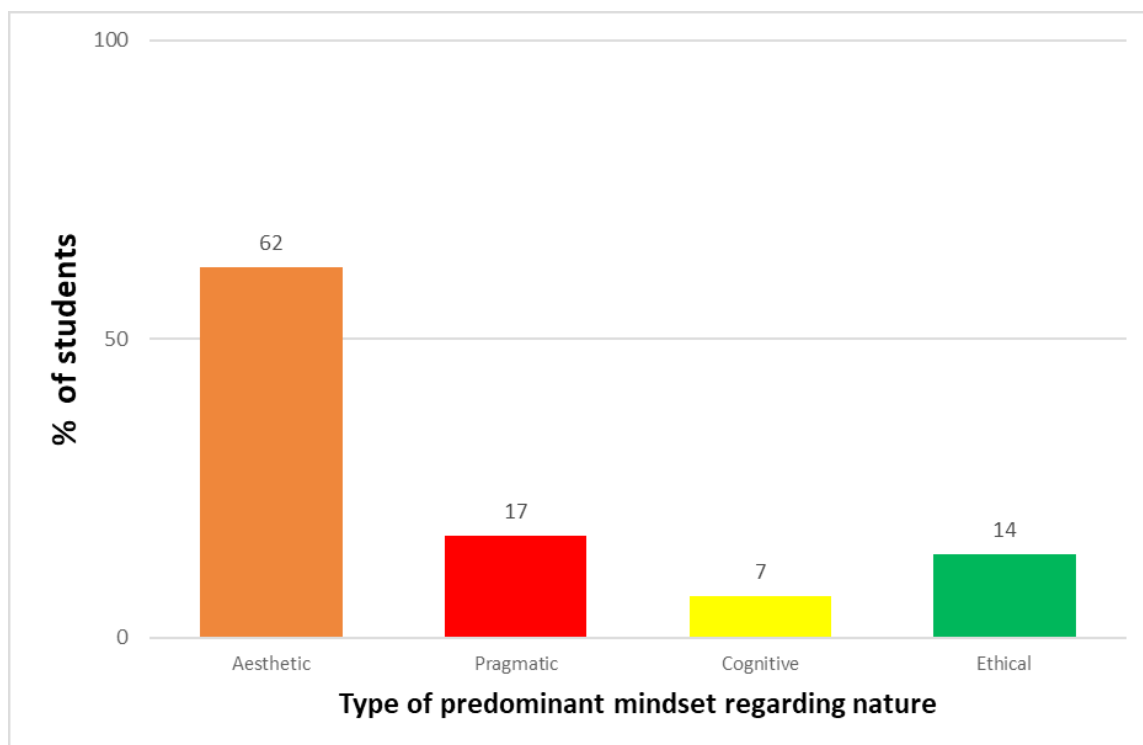*Fig. 2.* Environmental awareness of students (the Naturophile tool)

Fig. 3. Students' personal mindsets regarding the natural environment (the AESOP tool)

A pragmatic mindset regarding the natural environment was revealed in 17% of the respondents (see Fig. 3). This type of mindset corresponds to the empirically registered indicators of the Naturophile tool which are characteristic of the practical type of attitude to the natural world.

A cognitive mindset towards nature was identified in 7% of the students, which indicates a lack of interest in the cognitive aspect of ecology (see Fig. 3). This indicator is similar to the cognitive type of subjective attitude to nature identified with the Naturophile tool.

An ethical mindset towards the natural environment was revealed in 14% of the respondents, indicating that most students do not associate their interests with environmental activities or environmental movements (see Fig. 3). Similar results were obtained for the behavioral type of attitude to nature when we used the Naturophile tool. As we mentioned above, it is this type of mindset that best contributes to the implementation of the Sustainable Development Goals.

Summing up the results of the informative stage of our research, we can conclude that most students demonstrate a low level of environmental awareness, which hampers the implementation of the UN Sustainable Development Goals. To eliminate this problem, educational agenda of universities has to be revamped with additional measures to boost the development of environmental awareness in students. We have developed a technique for raising the level of environmental awareness. It is based on creative tasks of S. Yu. Stepanov's theory of co-creative reflexive technologies [11].

In view of the results of the conducted research and for the effective development of environmental awareness in students, we found it helpful to use the tasks based on the ideas of S. Yu. Stepanov [11] and A. A. Fortunatov and V. L. Benin [5]. The ideas are listed below:

(1) Discussing current issues with students an emphasis should be laid on environmental problems no matter the subject. It is important to take into account that a teacher may fail to know the right way to solve the problem, because possible solutions are many.

(2) Establishing interdisciplinary connections through non-standard use of connections between different pieces of information while taking into account the role they play in environmental issues. At the same time, the teacher's opinion (point of view) should have the same weight as the opinion of students working on the issue.

(3) Considering environmentally relevant material from various perspectives. A teacher may possess more knowledge for problem-solving, however, it might become an obstacle to finding a new and more effective solution.

(4) Interpreting the experience of environmental activity of students using scientific methods and techniques. The teacher helps the student to develop, test and demonstrate the feasibility of hypotheses, and monitors the research for scientific quality.

(5) Engaging in teacher-student collaboration to offer a new solution to a problem, create a new device, object or way of interaction as part of the efforts to preserve the natural environment.

(6) Establishing a teacher-student collaboration for the teacher to solve an environmental problem with a method or a technique that neither the student nor the teacher is aware of. Thus, the teacher becomes an equal participant in solving the problem. A possible scenario is to think of a possible problem based on a law that both the teacher and the student know well. This will require resorting to co-creative reflexive technologies.

(7) Developing lesson plans and giving classes as a joint teacher-student effort. Here, co-creation will result in the joint development of the form, methods, and content of a class with some environmental issues in its plan. At the same time, the teacher should actively support and encourage the students' initiative, thus contributing to the role that co-authorship plays in teaching and learning.

To exemplify the abovesaid, let us consider a couple of tasks based on co-creative reflexive technologies. The tasks were used in teaching full-time and part-time students.

Task 1. Find statements (thoughts, ideas, etc.) about environmental education in psychological and pedagogical literature written by famous teachers (two to three authors).

Based on your findings, answer the following questions.

(1) What is the author's message? Was it difficult to implement their ideas in their lifetime?

(2) Comment on how the author's idea can be applied in today's environmental, economic and educational context.

(3) Is there anything you feel like changing in their statements?

(4) Suggest your own idea in the field of environmental education of students.

Task 2. Students are offered to break up into small groups (four to five people) and come up with an alternative ending for well-known books about the environment (e.g., The Little Prince by Antoine de Saint-Exupéry; The Call of the Wild by J. London; Born Free by J. Adamson, etc.). At the end of the class, students choose the most successful and interesting ending by majority vote and reflect on the ideas offered by fellow students. At the same time, the teacher should not read out the original ending, giving the students an opportunity to get to know the book on their own.

All the presented tasks were used at different classes taught to both full-time and part-time students. At the end of the academic year, we conducted a control study of subjective attitude to the natural environment in the same groups of students. A statistically significant increase was observed in behavioral and cognitive types of students' environmental awareness, which, in turn, led to a decrease in the share of a practical attitude to nature ($p \leq 0.05–0.01$) (see Fig. 4).

It should also be noted that in the result of our experiment the level of students' attitude to nature increased (see Fig. 5). The data shown in Figs. 4 and 5 do not take into account mixed types of subjective attitude to nature (dimensions of the Naturophile tool).
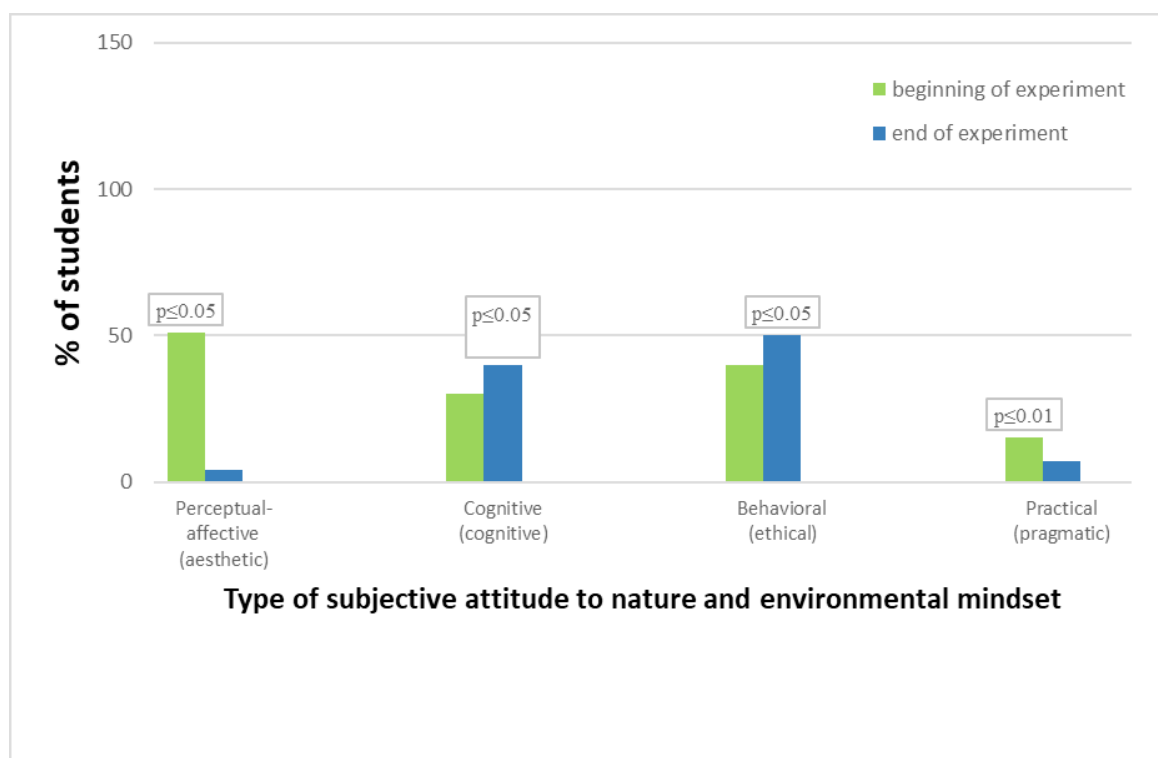

Fig. 4. The results of analyzing subjective attitudes to nature and environmental mindsets in students
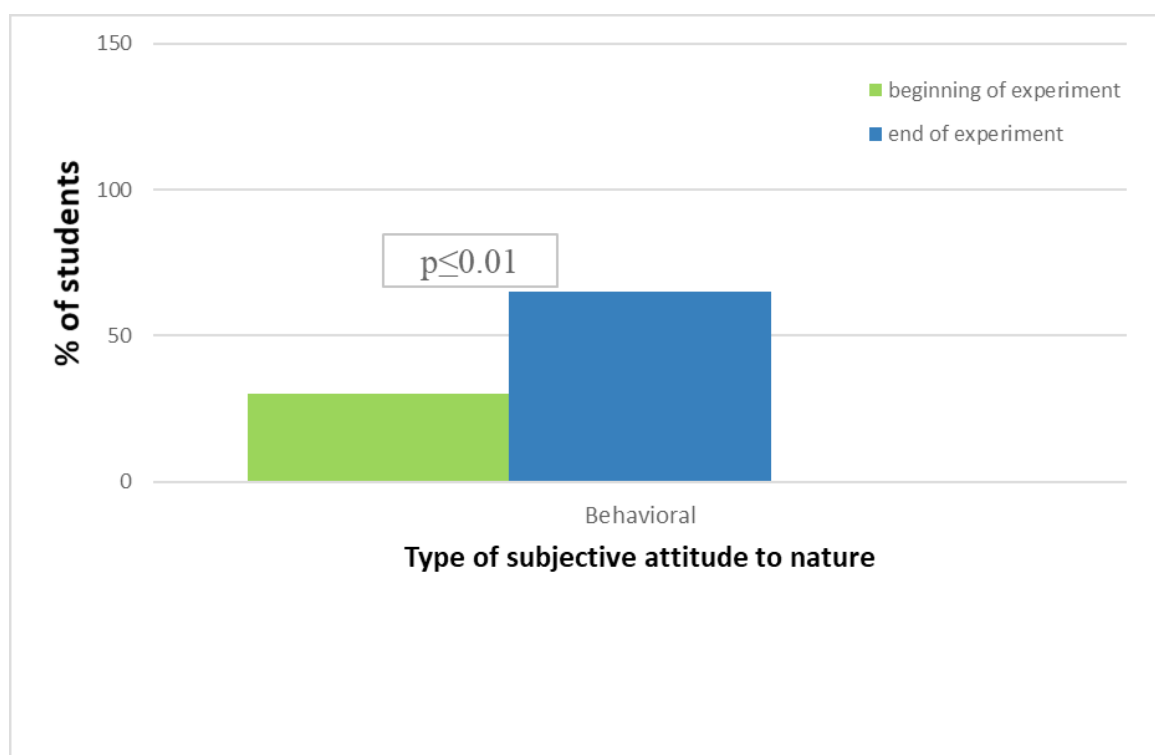
Fig. 5. The results of analyzing the level of students' attitude to nature

Discussion

Summing up the above, the development of environmental awareness in university students as an effort to address the challenges of sustainable development is a complicated and time-consuming process. It is necessary to reconsider the very process of presenting environmentally relevant information and make it creative, reflexive and engaging. Teacher-student interaction should not be limited to subject/object relations so that both the teacher and the student could find excitement in teaching and learning and contribute to their joint progress. This, as our research has shown, will promote a shift in students' environmental awareness from an anthropocentric to an ecocentric perspective.

The initial stage of our study showed that only 9% of the students had a behavioral type of attitude to the environment and were able to both engage in environmental activities and influence the behavior of other people. Only 4% of the respondents had a cognitive type

of subjective attitude to nature, which indicated a low level of interest in a research-based approach to tackle environmental issues.

Our experience of using tasks based on co-creative reflexive technologies in training students proved effective in the development of environmental awareness ($p \leq 0.05$-0.01) (see Figs. 4 and 5).

Conclusion

The paper analyzed the type and level of subjective attitude to the natural environment in university students. Over the past years, the global community has been increasingly concerned about the need to change people's attitude to the environment, hence, the relevance of the reported study. This concern is manifest in both Russian and international regulatory documents adopted in recent years. Those include, first and foremost, the Sustainable Development Goals adopted by the UN and the Paris Agreement on Climate Change (ratified by Russia). It is impossible to implement these

instruments without cultivating environmental awareness in the younger generation. In our opinion, one effective way to increase the level of university students' environmental awareness is through the tasks based on co-creative reflective technologies. At the control stage of the study, we used the Naturophile and the AESOP tools (developed by S. D. Deryabo and V. A. Yasvin). The study revealed that the majority of the surveyed students had an anthropocentric type of environmental awareness with the predominance of a perceptual-affective attitude to nature. This type of attitude implies a keen interest in the beauty of individual elements of nature, combined with total indifference to its other aspects. The cognitive

type of subjective attitude to nature was the least popular, which indicates a lack of interest in the scientific aspect of environmental protection. After the application of co-creative reflexive tasks in the classroom, we observed an increase in the level of students' environmental awareness. The control measurement by the Naturophile and the AESOP tools revealed a significant increase in the share of behavioral and cognitive attitudes in the structure of the university students' environmental awareness.

The results obtained in the reported study can find an application in the development of special programs, models and techniques aimed to shape environmental awareness in university students.

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