

# Enhancing environmental education for students by designing regional weekend hikes

Zinaida Tinkova<sup>1\*</sup> and Ivan Tinkov<sup>1</sup>

<sup>1</sup>Orel State University named after I.S. Turgenev, 95, Komsomolskaya st., 302026, Orel, Russia

**Abstract.** The article deals with the main problems related to environmental education of students. The analysis of activities aimed at environmental education is given. The plan of measures to enhance environmental education, which included practise-orientated tasks that improve environmental literacy and motivation of students, consisted of activities divided into components: environmental literacy activities; environmental planning activities; project implementation activities. The plan was implemented at the Faculty of Physical Education and Sports of Orel State University named after I.S. Turgenev. The diagnostic toolkit, questionnaires, and expert assessments have proved the effectiveness of the activities. Diagnostics included the evaluation criteria: cognitive, value, activity, and creative components. The study showed that the introduction of additional activities, such as the design and implementation of weekend hikes, increases the level of environmental education. **Key words:** Environmental education, project activities, students, weekend hikes.

## 1 Introduction

Environmental problems in Russia have always been one of the main topics of the country's scientific community. The diversity of approaches and ways of solving these or those problems has not only spurred the development of the science of "Ecology", but also had an applied reflection in their implementation in legislative projects. In the last few years, the trajectory of topical issues has changed and, as a consequence, many of the activities devoted to the environment have been suspended or terminated. For example, the national project "Clean Air", whose deadline has been extended from 2024 to 2026, or the national project "Ecology", whose deadline has also been postponed due to sanctions. Against this background, the fact that the global certification bodies Forest Stewardship Council (FSC) and the British I-REC have "left" Russia has a negative impact. This can lead to aggravation of environmental problems in the future and this fact makes us look differently at the environmental education of young people. The problem in this situation is the search for new, more relevant, modern, and interesting forms and programmes of environmental education for young people.

The existence of contradictions between effective and actual forms of ecological education of youth and existing annual calendar events that do not influence awareness of environmental problems among participants, and also between the need of applied,

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\* Corresponding author: foxunet@mail.ru

empirical experience of perception of environmental problems and formality, theoreticality of the most organized events marked the need to actualize possible programs and grants, activities and scientific research among students.

It was assumed that the development of an implementation plan for environmental literacy activities, based on weekend hiking projects within the region, introduced into student youth practise, would significantly increase interest in environmental issues and influence motivation to implement projects related to improving the region's ecology in the future.

## **2 Materials and Methods**

The object of the study is the process of enhancing the environmental education of students.

The research subject is the plan of implementation of environmental literacy activities for students of 49.03.04 Sports.

The aim of the study is to enhance environmental education in the student environment through the design of regional weekend hikes.

Based on the problem and the purpose of the research, the following tasks were defined:

1. To analyse the existing experience and theoretical foundations of environmental education, to determine the possibilities of its use in the student environment.
2. To develop a plan for implementation of environmental education activities for students of 49.03.04 Sports.
3. To prove effectiveness of the plan of introduction of measures of ecological literacy.

Theoretical and methodological basis of research served as scientific and methodological works of experts in the field of tourism, sports and ecology: problems of development of tourism in regions (A.J. Aleksandrova, V.S. Senin, M.B. Birzhakov, etc.); problems of ecotourism in Russia (J.L. Mazurov, A.V. Tikhomirova, etc.); basic concepts and directions of modern ecotourism in works - Arseniev E.I, Kuskov A.S., Feoktistova N.V., V.I. Tikhiiy, etc.); ecological education of students and schoolchildren (G.L. Rytov, T.V. Largina, I.A. Potapova, E.V. Burov, etc.).

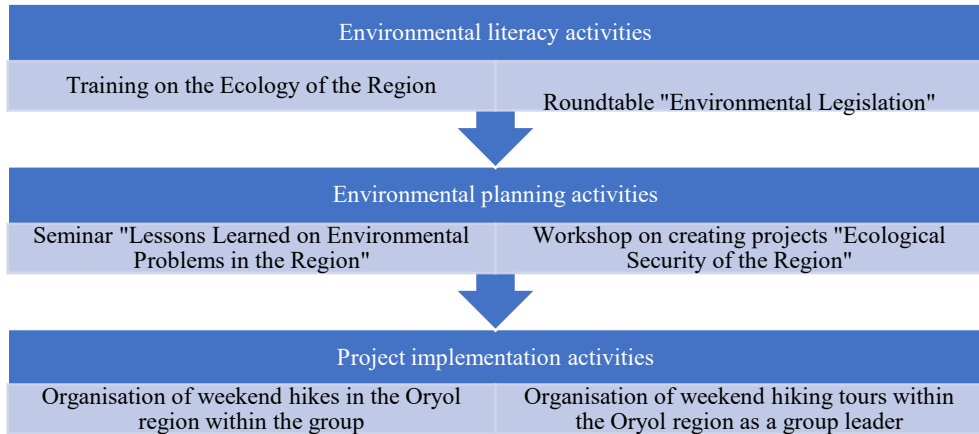
The following research methods were used: theoretical methods, which include - analysis, generalization and interpretation; empirical methods - pedagogical experiment, survey, testing; methods of mathematical statistics.

## **3 Discussion and Results**

Based on the analysis and synthesis of scientific and methodological literature on the research problem it was concluded that the work on environmental education is conducted within the framework of practice-oriented activities, where the student is a tool in the process of improving the environmental situation. Such events as "Environmental Descent", "University Subbotnik", "Clean-up" only confirm the absence of theoretical and modeling component in this complex process. At the same time theoretical knowledge base of basic laws and acting projects on solving ecological problems are necessary in increasing motivation to raise the level of ecological education of youth.

The above-mentioned significant gaps were taken into account in the development of the environmental literacy activities plan for the students. It was decided to divide the activities into areas and make the areas compulsory and sustainable units, while the activities themselves and the form were varied, depending entirely on the material and technical basis, the composition of the participants and the time of the event.

At the initial stage, the plan of activities was mainly aimed at introducing the students to the environmental problems of the region and at finding theoretical and then practical steps in solving the problems at the beginning.



**Fig. 1.** Environmental education action plan for students.

Especially important in the implemented action plan is the experience of organising weekend hikes and subsequently going on the same routes as a group leader. This helps the students to feel acutely all the nuances of environmental problems and to form a sustainable motivation to develop environmental literacy in the society.

Prior to the start of the experimental activity, a criterion-evaluation apparatus was developed, which included the following indicators:

1. The cognitive component expressed in the strength of assimilation of theoretical knowledge on ecology, degree of ability to model solutions of ecological problems, aspiration to self-education in the sphere of ecological education. In diagnostics of the given component the questionnaire "Naturalist", an assessment of ecological knowledge (completeness and durability of assimilation) was used [7].
2. The value component - it includes social empathy, which is defined with the help of the questionnaire "Dominant" [8].
3. The activity component - which includes interaction with nature, organization of environmental work, skills and practical abilities of nature protection, nature conservation and creative activities. It was assessed with the help of the diagnostic technique "Alternative". [8].
4. creative component - ability to independently design and implement environmental education activities - assessment of the developed hike of the output day by the expert group.

Each component had three levels of manifestation: low, medium and high.

Environmental education in higher education institution is a part of the educational programme and plays an important role. At the same time analyzing the calendar of events for students in 44.03.01 Pedagogical education and 49.03.01 Physical education it was found that only four events per year are purposefully aimed at environmental awareness and education.

That is why we decided to determine Turgenev Oryol State University as the study base. First-year students (60 people) were divided into control and experimental groups in the fields of training. 49.03.01 Physical education - experimental, 44.03.01 Pedagogical education - control. Since the students have the same faculty and a common graduating

department deals with the organization of the educational process, the initial indicators were equal.

The initial diagnostics included tests for all components except creative component. The first diagnosis was organised in September 2022 and included three days, as each test was organised with a break of a week to get more reliable results. The group was not informed of the division into control and experimental. Different coloured forms were given for each of the training areas and then the result was already determined.

Diagnostics of the cognitive component on the questionnaire "Naturopil", revealed that the ecological knowledge in the experimental and control groups is at an average level (Table 1.).

**Table 1.** Initial results of the 'Naturopil' questionnaire.

Initial scores		T-grade KG	T-grade EG	Interpretation
Scale	Perceptual and cognitive	48	48	Average
	Cognitive	51	52	Average
	Practical	47	48	Average
	Descenditure	40	46	Below average
	Naturalistic erudition	53	51	Average

The tables show the initial level of students in both groups in terms of motivation and orientation (Tables 2 and 3).

**Table 2.** Baseline results of the 'Dominanta' questionnaire.

no.	Focus	KG-grade	EG-grade	Rank of significance
1	Tangible assets	6	5	Average rank
2	Nature and animals	2	1	Most important
3	Surrounding people	3	3	Average rank
4	Intergender relations	4	5	Average rank
5	State	7	8	Least important
6	Morality	6	5	Average rank
7	Science and art	6	6	Average rank
8	Myself	1	2	Most important

The results of the 'Dominanta' questionnaire show that the difference in the scores between the groups is minimal, and refers to the same ranks of significance in the interpretation. This leads to the conclusion that personal value orientations predominate in the students, with nature and animals also being important, in the value system of the students.

**Table 3.** Results of the initial diagnostic 'Alternative'.

no.	Leading motivation type	KG motivation rank	EG motivation rank
1	Aesthetic	I	I
2	Cognitive	III – IV	III – IV
3	Practical	III – IV	III – IV
4	Pragmatic	II	II

In the assessment of the leading type of motivation, identical results were established in the studied groups for all indicators: pragmatic and cognitive type of motivation prevails, while the aesthetic type is at a low level. The results of the initial diagnostics highlighted the uni-directional motivation in both groups and the unified level of environmental education.

Then from October to December all the activities of the plan to enhance environmental education for the experimental group were implemented. The round table "Environmental legislation" was held within the framework of the discipline "Hygiene" and contained a

brief overview of the main changes in the legislation of the Russian Federation. Each student was given a topic or article of the law to talk about in advance, and then the group discussed the implications and perspectives. The training "Ecology of the region" was related to the practical implementation of knowledge about the Oryol region. The exercises of the training were related to the emotional-perceptual sphere of the student and helped to activate the desire to change the situation for the better. The training was organised in the traditional form and included: introduction and team building, the main part, which consisted of such exercises as: "Calling yourself", "My place in the world", "Tolerance is a value", "Creator of the future Eagle", "My and common Eagle", "Territory problem". The final part offered a game "Journey to the most beautiful point of the Eagle". The training was conducted within the framework of the class hour with the participation of the curator of the group.

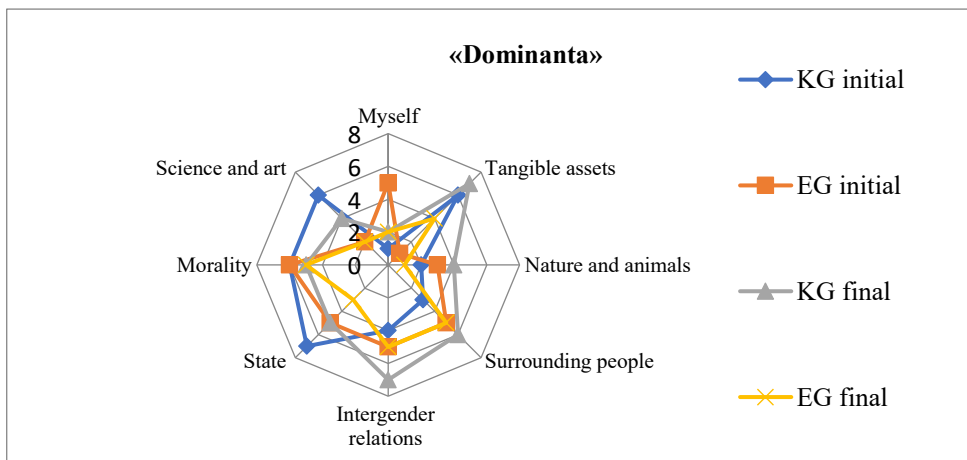
Activities aimed at environmental planning were organised remotely on the Zoom platform. The main objective of such activities was to learn how to identify the characteristics and needs of the region and to gain the skills to design relevant projects aimed at environmental education.

The project activities were creative in nature. The students were invited to take part in a weekend hike as an ecologist and try to compile a report on the results. The main condition was that the hikes had a cultural and educational character and included many cultural and art monuments as well as historical sites. The student hiking club "Traverse" was the organiser of the hikes.

The second stage was the development and implementation of our own weekend hike. Together with the Federation of Sports Tourism, the routes have been evaluated and the three most suitable ones have been chosen. Subsequently they were conducted with the schoolchildren attending the sports tourism class in the Gymnasium № 34 of the city of Oryol.

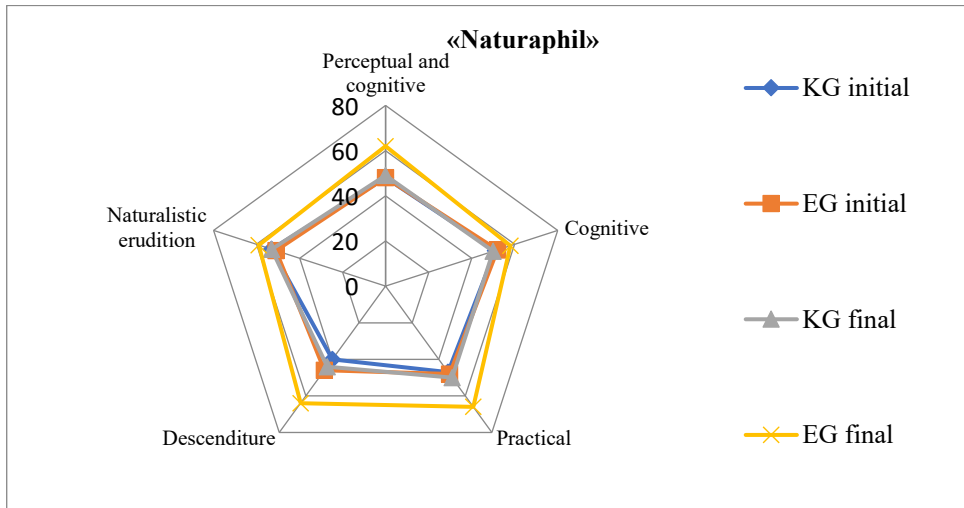
After the introduction of additional activities in the experimental group a final diagnostics was organised, the results of which confirmed the effectiveness of the practical approach to environmental education.

The final assessment was organised at the beginning of January 2023. There is a positive trend in many of the indicators (Figures 2 - 4).



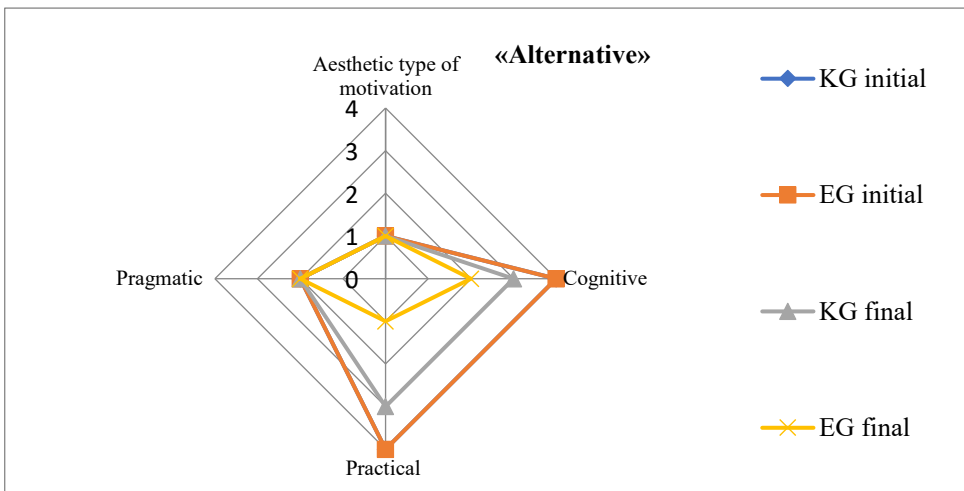
**Fig. 2.** The results of the increase in the "Domianta" diagnostic indicators.

The results indicated that there was a change in the direction of values in the experimental group. The "Nature and animals" and "Myself" categories have come to the fore. There was also a particularly significant increase in the "State" category.



**Fig. 3.** The results of the increase in the «Naturaphil» diagnostic scores.

The experimental group scored "Above Average" and "Average" in the final diagnosis. There was a noticeable increase in the "Practical" category, which is explained by the focus of the activities.



**Fig. 4.** Results of the increase in the "Alternative" diagnostic indicators.

And the final diagnostics also show significant changes, especially in the categories "Practical" and "Cognitive". The experimental group showed a keen interest in answering the questions, whereas the control group remained at a loss for answers.

The results shown in Figures 2-4 demonstrate a qualitative increase in the level of environmental literacy and environmental education.

The last component, the creative component, proved to be the most effective. They assessed the ability to independently design and implement environmental education activities. After taking part in building and organising weekend hikes, students not only gained experience in competent group leadership, route planning and working with children, but also learned how to focus the attention of their charges on ecological problems, to be more conscious in choosing camping places and in cleaning up after their

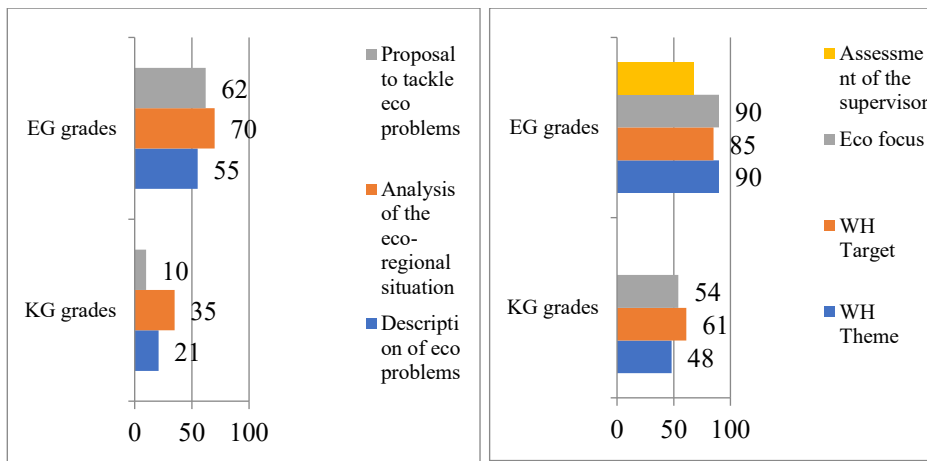
stay. We also organised diagnostics for the control group, but proposed that they theoretically justify ecological problems and compose a weekend hike based on their own experience.

As a result, the ecologist's report of each of the participants and the itinerary developed for the schoolchildren were evaluated. The evaluation was given by the three assessors, who gave marks according to categories (Table 5).

**Table 5.** Diagnostic results of the creative component.

Type	Criterion	KG grades	EG grades
Report	Description of environmental problems	21	55
	Analysis of the environmental situation in the region	35	70
	Proposal to solve environmental problems	10	62
WH	WH Theme	48	90
	WH target	61	85
	Environmental focus	54	90
	Assessment of the supervisor	-	68

The scores of the experts ranged from one to one hundred points, after which the average score of the group was calculated. The results show that the control group is inferior to the experimental group in all indicators. For a better illustration, the results are presented by level in Figure 1.



**Fig. 5.** Results of the expert assessment of the creative component.

## 4 Conclusions

Analyzing the available experience at the time of the study it is necessary to emphasize that the implementation in practice of theoretical knowledge on environmental education of students more effectively promotes their inclusion in the process, and they are more competent to find opportunities to use this knowledge in practice.

The plan of environmental education activities developed for students has a recommendatory character with the prospect of expanding and deepening as needed. The proposed components reflect the need for a systematic presentation of the material and in an accessible way to help master the theoretical and practical skills necessary for a fully developed person.

Proving the effectiveness of the implementation of the plan of measures of environmental education of students first of all, it is worth to pay attention to the increase of interest in environmental problems of their own region. Designing weekend hikes, as well as writing ecologist's reports contributed to the formation of a conscious, practical approach to the emerging and already existing negative factors occurring in the nature of the region.

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