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Fostering Positive Attitudes Toward the Environment in Primary School Students Amidst Ecological Issues

Kodirova Feruzakhon Usmanovna[1,], Fayziyeva Ubayda Yunusovna[1], Jurakhujayev Mukhammadazizkhuja Khalilkhuja[2], Yuldosheva Iroda Dilshodovna[3], Safieva Mokhinur Akram[1]*

[1]Chirchik State Pedagogical University, Chirchik, Uzbekistan
[2]Andijon State Pedagogical Institute, Andijon, Uzbekistan
[3]Olmaliq City Silk Road Innovations University, Uzbekistan
*Correspondence: E-mail: feruzausmon@mail.ru

ABSTRACT

This study aims to identify effective factors that contribute to the development of positive environmental attitudes among primary school students and to propose recommendations for the integration of innovative technologies in ecological education. A mixed-methods approach was employed, including pedagogical analysis, interviews, surveys, expert assessments, comparative analysis, modeling, and pedagogical experiments involving 250 students from grades 1–4 across several regions in Uzbekistan. The results revealed that prior to the intervention, students exhibited limited ecological knowledge and low practical engagement. After the implementation of targeted ecological education strategies, significant improvements were observed: 49.4% of students reached a high level of ecological awareness, while those at a low level dropped to 13.8–35%. The findings underscore the effectiveness of structured environmental education and innovative methods in enhancing students' moral development, ecological consciousness, and sense of responsibility. It is concluded that fostering environmental attitudes requires culturally contextualized, age-appropriate, and practically oriented interventions. These results provide a foundation for developing broader educational policies that integrate environmental ethics and sustainability in primary education curricula.

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1. INTRODUCTION

In recent decades, environmental degradation and the intensification of ecological issues have necessitated a global shift toward sustainability education, particularly at the foundational level of primary schooling. Environmental education is now recognized as a crucial component of shaping young learners' values, behaviors, and attitudes toward the environment (Abulude *et al*., 2022). Scholars argue that instilling ecological consciousness from an early age contributes significantly to the formation of responsible future citizens who can engage in sustainable practices and support long-term environmental protection efforts (Kamraju *et al*., 2024).

In Uzbekistan, national education policies have increasingly emphasized the integration of environmental education into the general curriculum. Ecology-related lessons in primary schools are not only a means of knowledge transmission but also serve as tools for moral upbringing and behavioral formation. These lessons aim to teach students the principles of respectful interaction with nature, environmental protection, and sustainable resource use. Educators must act as innovators and leaders in this endeavor, bridging education with progressive ecological values (Omolafe, 2021; Agarry, 2022; Hashim *et al*., 2024; Bantilan, 2024).

Despite these efforts, many primary school students still lack practical ecological awareness and consistent engagement with sustainability principles (Riyanto *et al*., 2021; Sadiq & Yusuf, 2024; Rozak *et al*., 2024; Obafemi *et al*., 2023). Although environmental education has been broadly studied and implemented, the existing approaches often fail to address the specific developmental needs and socio-cultural contexts of young learners. Previous studies by Uzbek scholars have laid the groundwork for ecological education in national contexts, focusing on theoretical, philosophical, and methodological dimensions. However, a critical gap remains in identifying which pedagogical strategies most effectively foster positive environmental attitudes among primary school students in real-world classroom settings.

This research seeks to address this gap by evaluating innovative and culturally relevant methods for forming positive environmental attitudes in children. The urgency of the study lies in the increasing ecological challenges faced by Uzbekistan and the world, which demand a generation that not only understands but also embodies ecological responsibility. The purpose of this study is to identify key factors that effectively influence the formation of positive environmental attitudes among primary school students and to propose an instructional framework based on innovative pedagogical technologies. The research employs a combination of qualitative and quantitative methods, including experimental designs, surveys, and pedagogical analysis conducted in primary schools across several Uzbek regions. This study contributes novel insights by integrating national traditions and regional characteristics into the ecological education process, thus offering a culturally grounded and practically tested model for developing environmental awareness and responsibility among young learners.

2. METHODS

This study employed a mixed-methods experimental design to explore the development of positive environmental attitudes among primary school students. The research combined qualitative and quantitative approaches, including pedagogical observation, interviews, questionnaires, expert evaluations, and experimental interventions. Data analysis involved comparative techniques, scientific generalization, and statistical evaluation.

2.1. Participants

The study involved 250 primary school students from grades 1 to 4 across general education schools in the cities of Chirchik, Jizzakh, and Denov, Uzbekistan. Participants were selected based on purposive sampling to ensure representation of different regional and socio-cultural contexts.

2.2. Procedure

The research was conducted in several phases. First, a baseline assessment was carried out using questionnaires and observations to evaluate students' initial ecological awareness and attitudes. Next, an experimental intervention was implemented through specially designed ecological education modules, which incorporated interactive, inquiry-based, and value-oriented learning methods. These lessons emphasized the connection between humans and nature, promoted critical thinking, and integrated moral and ethical dimensions into environmental topics.

Each lesson encouraged students to observe, reflect, and engage in hands-on ecological activities, such as planting trees, conserving resources, and exploring nature. Teachers were trained to facilitate lessons that combined emotional engagement with cognitive understanding, fostering empathy and responsibility toward the environment.

2.3. Data Collection and Analysis

Data were collected through pre- and post-tests, structured interviews, classroom observations, and expert assessments. Students' responses were analyzed to determine shifts in ecological knowledge, emotional engagement, and behavioral tendencies. Quantitative results were processed using descriptive statistics to classify development levels into high, middle, and low categories. Comparative analysis was used to measure differences between the control and experimental groups over the course of the intervention.

3. RESULTS AND DISCUSSION

The research commenced with a baseline assessment of ecological awareness among first-grade students in selected primary schools, utilizing questionnaires, structured observations, and informal interviews. The diagnostic phase revealed that a significant proportion of students lacked the practical ecological competencies necessary for daily environmental responsibility. Although many were familiar with basic concepts of environmental care such as not littering or the importance of trees their understanding remained mostly superficial and theoretical. Students were classified into three categories based on their ecological development: (i) intermediate level those who showed awareness but did not consistently translate it into behavior; (ii) low level those who recognized environmental issues but rarely acted accordingly; and (iii) high level students who consistently practiced eco-friendly behaviors. Initially, only 30.7% of students demonstrated any form of practical ecological competence, with the majority falling into the low and intermediate categories.

To address these gaps, the study implemented an experimental ecological education intervention in several primary schools across Chirchik, Jizzakh, and Denov. The intervention was designed around a dual-stage framework that incorporated innovative pedagogical approaches, task-based learning, and age-appropriate experiential activities tailored to the developmental stages of primary school students. The two main stages of the intervention were:

(i) Practical Engagement with Nature: This stage involved immersive, hands-on activities that connected students directly with the natural environment. Activities included tree planting, maintaining school gardens, collecting recyclable materials, observing local flora and fauna, and participating in eco-friendly school campaigns. These engagements were not only aimed at reinforcing knowledge but also at nurturing key values such as cooperation, empathy, responsibility, and aesthetic appreciation of nature. The approach promoted active learning and emotional involvement, both of which are crucial in internalizing ecological values.

(ii) Academic Integration with Ecological Awareness: In this phase, ecological themes were infused into core academic subjects—such as language, literature, visual arts, music, and social studies—through interdisciplinary teaching. For example, students wrote stories and poems about nature, created visual art projects from recycled materials, and studied local ecological traditions and folklore. This stage aimed to deepen students' ecological literacy and foster a more holistic worldview by integrating environmental consciousness into both cognitive and affective domains of learning.

The evaluation of the intervention was conducted using a mixed-method approach. Quantitative data were gathered through pre- and post-tests, while qualitative insights were obtained via interviews with teachers and analysis of student behavior and work products. The control group and experimental group each consisted of 200 students. **Tables 1 and 2** illustrate the development levels of students in both groups before and after the intervention.

Table 1. Control group: Development levels before and after experiment.

Experimental Period	No. of Students	Levels of Development		
		High	Middle	Low
Beginning of Experiment	200	55	59	86
End of Experiment	200	55	60	85

Table 2. Experimental Group: Development levels before and after intervention.

Experimental Period	No. of Students	Levels of Development		
		High	Middle	Low
Beginning of Experiment	200	55	60	85
End of Experiment	200	84	78	38

The results indicate a significant improvement in the ecological awareness and behavioral competencies of students in the experimental group. The proportion of students in the "high" category increased from 27.5% to 42%, while those in the "low" category dropped from 42.5% to 19%. In contrast, the control group showed no significant change, suggesting that the gains observed were directly attributable to the structured ecological education program.

These findings affirm the effectiveness of integrating experiential learning with interdisciplinary content in shaping young learners' environmental attitudes. The intervention not only enhanced students' ecological understanding but also instilled a deeper emotional and moral connection to environmental issues. By situating environmental education within students' real-life experiences and cultural contexts, the program succeeded in cultivating sustainable attitudes and behaviors from an early age.

Moreover, the research underscores the importance of aligning ecological education with students' developmental psychology. Activities that stimulate curiosity, foster empathy, and encourage active participation were shown to be particularly impactful. The results suggest that environmental values are best internalized when taught through emotionally engaging

and contextually relevant experiences, rather than solely through abstract or theoretical instruction.

In light of these outcomes, the study recommends broader implementation of similar ecological education programs across other regions and educational settings. Future research may explore longitudinal impacts of such interventions and assess their scalability. By embedding ecological responsibility into the fabric of early education, schools can play a pivotal role in preparing a generation that is not only environmentally literate but also emotionally and ethically committed to sustainable living.

4. CONCLUSION

The scientific investigation into fostering a positive attitude towards the environment among primary school students reveals that the role of modern educators is crucial in designing learning content that is appropriate to the psychological development and pedagogical needs of young learners. A positive attitude toward the environment forms the foundation of students' ecological consciousness and shapes their moral values, serving as an integral part of their worldview. This attitude is not limited to theoretical understanding; it involves the acquisition and practical application of environmental knowledge and skills. Cultivating such an attitude is a complex process that includes understanding the laws of nature and social development, recognizing the necessity of environmental protection, anticipating the consequences of ecological neglect, and committing to ethical behavior toward the environment. Ultimately, developing this environmental awareness from an early age is essential for preparing responsible and ecologically conscious future generations.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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