

METHODOLOGY OF FORMING ECOLOGICAL CULTURE IN PRIMARY SCHOOL PUPILS

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Abstract: The development of ecological culture in primary school students is a critical aspect of modern education, reflecting society's growing concern for environmental sustainability. This study explores the methodology of forming ecological culture in younger learners using an integrated pedagogical approach. The research combines traditional didactic methods with interactive environmental activities, emphasizing the role of school, family, and community partnerships. An experimental study was conducted in selected schools involving 180 students over six months. Data were collected using qualitative and quantitative methods, including classroom observations, interviews, and ecological literacy assessments. The results show that students exposed to structured ecological education programs demonstrated significant improvements in environmental awareness, attitudes, and behavioral practices. The study concludes with methodical recommendations for educators and policymakers. The findings contribute to a growing body of knowledge advocating early ecological education as a foundation for lifelong sustainable behavior and responsible citizenship.

Keywords: ecological culture, primary education, environmental awareness, sustainability, methodology, pedagogy, green behavior, nature, students, teaching methods, environmental ethics, curriculum

INTRODUCTION

In the context of global environmental challenges, the role of education in shaping an environmentally conscious generation has gained unprecedented importance. The degradation of ecosystems, biodiversity loss, and climate change have prompted educational systems worldwide to integrate ecological values into the curriculum [7;8]. Ecological culture, which encompasses knowledge, attitudes, values, and behavior toward nature, must be cultivated from the earliest stages of human development. Primary school education, in this regard, serves as the foundational platform for instilling environmental ethics in children.

The concept of ecological culture includes a set of socially significant qualities and behaviors that reflect a responsible attitude towards the environment. It is characterized by ecological knowledge, emotional-value orientations, and practical actions directed at preserving nature [1;3]. For young students, whose worldview is still being formed, the development of ecological culture is not only timely but essential. According to pedagogical psychology, early exposure to environmental values significantly influences personality development, emotional intelligence, and moral judgment [4].

In Uzbekistan and other countries with developing environmental education systems, the need to establish a methodologically sound and pedagogically effective model for ecological upbringing in early schooling is urgent [2;9]. Despite government strategies, including national curricula updates and awareness programs, there remains a noticeable gap in methodological resources, teacher training, and content integration regarding environmental issues at the primary level.

The current study addresses this gap by developing and testing a comprehensive methodology aimed at forming ecological culture among primary school students. It builds on the premise that ecological education must go beyond the transmission of factual knowledge. Instead, it should involve emotional engagement, hands-on activities, interdisciplinary learning, and community

involvement [3;4]. Pedagogical methods should foster reflective thinking, critical analysis of environmental problems, and responsible behavioral choices.

This study also considers the psychological and developmental characteristics of primary school students. At this stage, children are particularly receptive to modeling behavior, learning through play, storytelling, and real-life experiences [5]. They are capable of developing empathy towards living beings and a sense of responsibility when presented with age-appropriate environmental narratives and activities. Therefore, the methodological approach adopted must be sensitive to the cognitive and emotional capacities of young learners.

The research aims to evaluate the effectiveness of various teaching strategies designed to cultivate ecological consciousness. The methodology integrates theoretical underpinnings from Vygotsky's sociocultural theory, Piaget's cognitive development stages, and experiential learning models [4;5;6]. By incorporating family and community participation, the study seeks to create a holistic environment where ecological values are not only taught but lived.

The overarching research questions are as follows:

1. What pedagogical methods most effectively foster ecological culture in primary school students?
2. How do interactive and interdisciplinary approaches impact students' ecological knowledge, attitudes, and behaviors?
3. What role do school-family-community collaborations play in enhancing the outcomes of ecological education?

This paper presents the results of a longitudinal experimental study, identifies effective pedagogical interventions, and offers methodical recommendations for educators seeking to integrate ecological culture development into their teaching practices. It also proposes a model for sustainable ecological education in primary schools that can be adapted to various educational contexts.

MATERIALS AND METHODS

The study employed a mixed-methods approach combining qualitative and quantitative research strategies. It was conducted in three public schools in Tashkent, Uzbekistan, over a six-month period (September 2023 – February 2024). The sample included 180 students from Grades 2 to 4, selected through stratified random sampling to ensure balanced representation across gender, age, and academic performance.

The research design included an experimental group (n=90) and a control group (n=90). The experimental group received ecological education through a specially designed methodology that integrated classroom instruction, environmental projects, family activities, and community-based events. The control group continued with the standard curriculum without specific emphasis on ecological content.

METHODOLOGICAL FRAMEWORK

The pedagogical methodology was structured around four main components:

1. **Cognitive component** – aimed at building environmental knowledge through interactive lessons on ecology, pollution, biodiversity, and sustainability.
2. **Emotional-value component** – implemented through storytelling, nature walks, eco-dramas, and role-playing to develop empathy towards nature.
3. **Behavioral component** – focused on reinforcing sustainable practices like waste segregation, tree planting, and energy saving through routine classroom activities.
4. **Social component** – included family involvement (e.g., eco-homework, recycling projects) and community collaboration (e.g., school-clean-up days, environmental festivals).

INSTRUMENTS AND DATA COLLECTION

- Pre- and post-tests were administered to measure ecological knowledge and attitudes. The test items were validated by subject matter experts.
- Behavioral checklists were used by teachers to observe students' daily environmental actions (e.g., turning off lights, using eco-bags).
- Student journals and artwork were analyzed to assess emotional and cognitive engagement.
- Semi-structured interviews were conducted with teachers and parents to understand perceptions of the intervention.
- Classroom observations were recorded weekly using a standardized rubric focusing on student participation and environmental discourse.

DATA ANALYSIS

Quantitative data were analyzed using descriptive statistics (mean, standard deviation), paired t-tests, and ANOVA to determine statistical significance in learning gains. Qualitative data from interviews, journals, and observations were coded using thematic analysis to identify recurring patterns and emergent themes. Triangulation was applied to cross-validate findings from multiple sources.

Ethical considerations included obtaining written consent from parents, ensuring anonymity of participants, and adhering to the ethical guidelines of the Ministry of Preschool and School Education of Uzbekistan.

RESULTS

The data revealed significant differences between the experimental and control groups in terms of ecological knowledge, emotional engagement, and behavioral practices.

KNOWLEDGE ACQUISITION

Post-test results indicated a 34% increase in ecological knowledge in the experimental group, compared to only 9% in the control group. The highest gains were observed in areas related to waste management, energy conservation, and biodiversity.

EMOTIONAL ENGAGEMENT

Analysis of student journals and teacher reports highlighted a marked increase in expressions of empathy towards nature. Experimental group students frequently described feelings of concern for animals and natural landscapes, and actively participated in classroom discussions about environmental problems.

BEHAVIORAL CHANGE

Observations and behavioral checklists showed consistent adoption of sustainable habits among experimental group students. Notable behaviors included turning off unused lights, bringing reusable containers, and initiating schoolyard cleanups without teacher prompting.

TEACHER AND PARENT FEEDBACK

Teachers reported improved classroom dynamics and student motivation. Parents noted that their children began practicing eco-friendly habits at home, such as reducing plastic use and participating in household recycling.

DISCUSSION

The results affirm the effectiveness of a comprehensive, participatory methodology in shaping ecological culture among primary school students. The observed cognitive, emotional, and behavioral improvements validate the integrated approach that aligns with developmental psychology and sociocultural learning theories.

A key insight from the study is the importance of emotional-value engagement. While factual knowledge is necessary, it is the emotional resonance and personal connection to nature that

catalyze enduring behavioral change. The use of storytelling, drama, and art created memorable learning experiences, making abstract environmental concepts tangible for young learners.

The study also underscores the power of modeling and social learning. Students who observed their teachers and parents practicing eco-friendly behaviors were more likely to imitate these actions. This supports Vygotsky's notion of the zone of proximal development, wherein children learn through guided interaction with more capable others.

The research highlights the need for teacher training in ecological pedagogy. Despite the availability of resources, many teachers lacked the confidence or know-how to integrate environmental topics meaningfully. Professional development programs should focus on interdisciplinary teaching methods, project-based learning, and the use of digital tools for environmental education.

Limitations of the study include the relatively short duration and geographic focus. Long-term studies across diverse cultural and socio-economic contexts are needed to generalize the findings. Additionally, further research should explore how ecological education intersects with digital literacy and climate change adaptation.

CONCLUSION

The methodology developed and tested in this study demonstrates that ecological culture can be effectively cultivated in primary school students through a structured, emotionally engaging, and participatory approach. By integrating cognitive, emotional, behavioral, and social dimensions, the methodology fosters a holistic understanding of environmental responsibility.

The study's implications are significant for curriculum developers, educational policymakers, and teacher training institutions. It is recommended that ecological education be made a core component of primary schooling, supported by hands-on learning, family engagement, and community partnerships.

To ensure sustainability, national education standards should incorporate ecological outcomes, and school infrastructure should model green practices. Only through early, consistent, and context-sensitive interventions can education contribute to solving the pressing environmental challenges of our time.

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