

## **Ecological education - an essential component in achieving sustainable development goals**

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**Abstract.** The purpose of the article is to highlight the critical role that ecological education plays in fostering environmental awareness, responsibility, and sustainable behavior among individuals from an early age. It also underscores the need for proactive and interdisciplinary approaches to environmental education to empower future generations to protect and preserve natural resources.

The methodology of the article is based on a qualitative, experiential approach, utilizing the eTwinning project “Earth friendly STEM+ A” as a practical model of ecological education applied in early childhood. The project was implemented with preschoolers and involved: Integrated thematic activities combining science, technology, engineering, arts, and mathematics (STEM+A) with environmental topics; Experiential learning methods such as outdoor exploration, hands-on ecological tasks (e.g., cleaning green spaces, planting, sorting waste), and creative expression; Collaborative learning involving educators, children, families, and the local community; Reflective observation of children’s behaviour, engagement, and understanding throughout the project.

This approach allowed for observing how ecological values and sustainable behaviours can be effectively cultivated from a young age through active participation and environmental interaction.

Key findings in the article include that early exposure to nature through outdoor activities fosters a stronger emotional connection between children and the environment, while preschoolers can understand and apply basic ecological principles (such as recycling, caring for plants, or respecting nature) when taught through hands-on, age-appropriate experiences. Moreover, experiential, project-based learning (like in the eTwinning “Earth friendly STEM+A” project) enhances curiosity, critical thinking, and creativity, and environmental education increases children’s sense of responsibility toward nature and promotes pro-environmental behaviour. Finally, family and community involvement strengthens the impact of ecological education, encouraging consistency between learning at school and practices at home,

The article concludes that ecological education is a vital foundation for fostering environmental awareness and responsibility from an early age. By integrating experiential and nature-based learning approaches, such as those used in the “Earth friendly STEM+A” project, preschoolers develop critical thinking, creativity, and a lasting connection to the natural world. This early engagement not only cultivates respect and care for the environment but also contributes significantly to achieving broader sustainable development goals. Therefore, embedding

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ecological education within early childhood curricula is essential for nurturing informed, responsible future citizens committed to environmental stewardship.

**Keywords:** Ecological education; Sustainable development; Early childhood education; Outdoor learning; Environmental awareness; STEM education; Preschoolers.

## **1. Introduction**

Mother Nature generously provides us with all its resources unconditionally, in an abundance that supports life on Earth. However, in the current context, marked by population growth, intensified industrial processes, and frequently uncontrolled human interventions in the environment, the issue of protecting nature is becoming increasingly pressing. In this context, the educational dimension takes on an essential role. Environmental education addresses everyone – both children and adults – and, although it is not a recent theme, its relevance and urgency are constantly increasing. Thus, it becomes a priority objective in numerous teaching activities carried out in the framework of interest centers and experiential domains, starting from early education.

Ecological education involves not only the formation of responsible behavior towards nature and the environment but also the cultivation of an attitude of active involvement in its protection. The process begins in the family environment, where the influence of parental modeling and the power of communication play an essential role in shaping the child's ecological values.

In kindergartens, learning should take place in a natural way, starting from the child's knowledge and curiosity, towards exploring the diversity of forms and phenomena of nature through direct experience. An effective educational approach provides the child with the opportunity to rediscover nature through direct interaction, in a process guided by the educator, who becomes a facilitator of learning. Understanding nature in its depth means understanding the directions of the future, and protecting it equates to a valuable contribution to the well-being of future generations.

## **2. Research methodology**

This study was designed to examine the impact of ecological education on early childhood learning, guided by the hypothesis that integrating ecological content into preschool activities can increase children's awareness, responsibility, and proactive behaviour toward environmental protection and sustainable practices. The research was carried out with a group of 28 preschool children, aged between five and six years, from the „Ion Creangă” Kindergarten in Slatina – Olt, Romania. Over the course of five months, the children participated in a structured programme developed within the eTwinning project “Earth Friendly STEM+A”. The project integrated ecological themes with interdisciplinary learning, encouraging children to engage in meaningful experiences that combined science, technology, engineering, arts, and mathematics with environmental topics. Through this approach, the methodology aimed to provide rich, hands-on opportunities for exploration and reflection, enabling the observation of how ecological values and sustainable behaviours could be fostered from an early age.

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Key types of activities included:

- Informative sessions on forests and biodiversity
- Practical eco-friendly actions (e.g. cleaning and greening the kindergarten yard)
- Artistic and creative workshops using recyclable materials
- Outdoor exploration and STEM-based nature investigations
- Activities in partnership with families and the local community

The eTwinning ecological education project "Earth Friendly STEM+ A," implemented with the preschoolers of the large group from the "Ion Creangă" Extended Program Kindergarten in Slatina, had as its main goal the development of early ecological awareness. The initiative aimed at fostering a responsible attitude towards the natural environment, by cultivating respect for nature, the rational use of its resources, and the active involvement of children in actions aimed at protecting and conserving the environment. The project included practical-household activities, as well as educational partnerships with families and the community, while also promoting the continuous strengthening and optimization of the relationship between the child and the surrounding environment.

### **3. Results**

By framing the text as a "love letter," the book *Thank You, Earth: A Love Letter to Our Planet* taps into emotions, helping children form a personal bond with the planet. The author's message for kids is to appreciate, respect, and care for the natural world. April Pulley Sayre encourages children to: notice the beauty and diversity around them, feel a sense of wonder and connection to the Earth, understand that showing gratitude for the planet includes protecting it and develop environmental awareness through kindness, curiosity, and action (Pulley Sayre, 2018). Her message is gentle but powerful: the Earth gives us so much—let's be thankful and take care of it in return.

Children are in an essential stage of personality formation and development, characterized by defining their own system of values, building self-image in relation to others, and taking an active role in their own becoming. During this period, essential components of emotional, social, moral conduct, and lifestyle are outlined and developed. To achieve a successful transition from the dependence characteristic of the preschool period to the autonomy and responsibilities specific to school age, children need constant support in a safe, stimulating, and friendly educational environment. The project represented a true challenge both for me as a teacher and for the children, but its impact was significant and beneficial for all involved.

Concrete examples of results observed:

- Children were able to identify major sources of pollution and suggest solutions
- They showed increased interest in recycling and waste sorting
- Many began adopting pro-environmental behaviors at home (e.g., saving water, using cloth bags)
- Improvement in teamwork, observational thinking, and creativity
- Parents reported children encouraging sustainable habits within the family

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This practical approach demonstrates that ecological education in early years can effectively lay the foundation for responsible citizenship and a more sustainable future.

#### **4. Discussion**

Through the implementation of this new project, we aimed to encourage environmental protection activities, raise children's awareness about cleanliness, develop a critical spirit regarding current, real, and visible environmental issues, as well as to develop and practice skills necessary for investigating, identifying, and especially solving environmental problems.

The "Earth Friendly STEM+A" project provided preschoolers with the opportunity to actively engage in a wide range of interdisciplinary educational activities: thematic information about the forest, actions for cleaning the outdoor space of the kindergarten, dynamic and creative activities, artistic-plastic activities, practical-household activities, as well as exploration activities in the outdoor environment. These were complemented by hiking, walks, and outdoor games, aimed at facilitating learning through direct experience. The most valuable result of the project was the stimulation of children's observational, critical, and creative thinking. Thus, the project significantly contributed to the formation of early ecological awareness, supporting the development of active and responsible behavior towards the environment, the health of the community, and the quality of future life.

In the book "We Are Water Protectors" by Carole Lindstrom, the author emphasizes the idea that water is a life-giving force and must be treated with respect (Lindstrom, 2020). The book also incorporates indigenous values, culture, and storytelling to highlight the deep connection between people and nature—promoting cultural respect and environmental ethics. Children are portrayed as active protectors of the Earth, encouraging responsibility and agency from a young age—essential values in ecological education. The story shows that protecting the environment requires unity and collective responsibility, aligning with collaborative outdoor activities and team-based learning in early education. The "black snake" (representing oil pipelines) introduces environmental threats in a child-appropriate way, useful for discussing real-world issues in nature-based education.

A study from Deakin University found that "beach kindergarten" programs, where children engage in learning activities at the beach, significantly improve their understanding of math and science concepts. The natural, dynamic environment offers unique opportunities for experiential learning (Herald Sun, 2024).

Another study called „The Importance of Early Childhood Environmental Education” outlines eight benefits of introducing sustainability concepts in early childhood, including fostering responsibility, enhancing critical thinking, boosting creativity, and supporting well-being. It provides practical strategies for educators to incorporate environmental education into daily routines (Nature of Early Play, 2024).

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## **5. Conclusions**

The kindergarten of today will soon be the school of tomorrow, the educational institution having the sacred mission, among many others, to teach children to live beautifully and healthily. Because the right of every being to have a healthy environment is a fundamental right, it is in our power to act. In the context of an increasingly accelerated and artificialized society, early education takes on the essential role of promoting the development of ecological awareness and forming essential skills, meant to support the active and constructive involvement of each individual in conserving natural resources, preventing pollution, and protecting the surrounding environment, perceived as the foundation of life on the planet.

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