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New Approaches
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TEACHING FOR A SUSTAINABLE FUTURE: CASE STUDIES FROM THE GREEN SCHOOLS PROJECT IN BULGARIA

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Abstract. This article examines the implementation and impact of green education activities in primary schools across Bulgaria, as part of the Green Schools Project, supported by Erasmus+ Programme. Through detailed case studies, the research highlights how seven primary teachers integrated environmental education into their classrooms, fostering ecological awareness and sustainable practices among their students. The activities ranged from recycling projects and nature observation walks to role-playing games that traced the journey of food from seed to consumption. The findings demonstrate significant improvements in students' knowledge of ecological principles, increased motivation and engagement in green topics, and positive behavioral changes towards environmental stewardship. This study underscores the importance of integrating green education into the primary curriculum, providing insights and recommendations for future educational policies and practices aimed at nurturing responsible and proactive environmental citizens.

Keywords: Green education; primary schools; Bulgaria; environmental awareness; sustainable practices

Introduction

In 2016, the Bulgarian Ministry of Education and Science issued an ordinance establishing a state education standard for civic, health, ecological, and intercultural education[1]. This standard aims to develop ecological culture, consciousness, and behavior, promoting sustainable use of natural resources and environmental protection. The key objectives include ensuring students' knowledge of ecological norms, understanding public and civil mechanisms for environmental protection, and building skills to connect different public life spheres to address environmental and global challenges.

Aligned with these national standards and the EU Green Deal[2], an Erasmus+ Project titled Green Schools[3] was implemented during the 2022 – 2023 academic year. This project was a collaborative effort by three trade unions of teachers from Bulgaria, Romania, and Serbia. The motivation behind this project was to

encourage and enrich the efforts of primary school teachers in contributing to the green competences of their pupils. Within the project, a theoretical and practical model called Green Education for Primary Teachers was developed to ensure a common approach in the training of a pilot group of teachers. This model is based on the European Sustainability Competence Framework (GreenComp), which highlights 12 competences aimed at integrating sustainability values and practices into education (Bianchi et al. 2022). These competences emphasize embodying sustainability values, embracing complexity in sustainability, envisioning sustainable futures, and acting for sustainability. A key element of the framework is fostering individual responsibility and collective action for ensuring sustainability. The importance of embedding more holistic model of green education is further confirmed by a recent study by the OECD and the Joint Research Centre of the European Commission on the level of sustainability competences of young persons in the EU. According to the study results (Borgonovi et al. 2022), nearly 80% of young people report being aware of climate change and global warming. However, while they are aware, they are less likely to participate in collective activities aimed at promoting environmental protection. The report emphasizes the need for education systems to foster both awareness and proactive engagement in sustainability practices.

The current article focuses on synthesizing the immediate effects from the piloting of the Green Schools theoretical and practical model in Bulgaria, providing ground for further research, policy development, and practical recommendations to enhance sustainability education in primary schools.

Methodology

To evaluate the effectiveness of the Green Education for Primary Teachers model, a pilot program was conducted in Bulgaria. Teachers underwent a comprehensive training program designed to equip them with both theoretical knowledge and practical tools for promoting sustainability and environmental stewardship. The training focused on the EU Green Competences Framework, emphasizing the integration of green topics in primary education. Circular Economy Concepts were introduced, promoting sustainable production and consumption. Key themes such as Love Nature, Care for Nature, and Zero Waste were emphasized to foster a deep connection and respect for nature among students and minimize waste. Effective teaching methods included daily rituals, thematic movies, project-based learning workshops (Greenshops), inviting green speakers, and outdoor activities like green trips and missions.

The pilot implementation involved using a green learning activity description template and a training report template to standardize the documentation and evaluation of efforts. The reported period for this pilot was from February 1, 2023, to May 15, 2023. The teachers participating in the training were selected by the

Bulgarian Union of Teachers based on several criteria: being primary education teachers, having a specific interest in providing new forms of green education, having previous experience in testing green practices, and representing different geographical regions. As a result, 17 teachers were selected and invited to a one-day training course following the Green Education for Primary Teachers model.

Following the training, the teachers were asked to describe the green education activities to be piloted using a common template to ensure consistency and alignment with the program's goals. These activities were reviewed and approved by the project team, including the researcher of this article, to ensure they met the predefined criteria for promoting sustainability and environmental education. At the end of the piloting period, six reports were received from seven teachers (two teachers worked as a team in one case). The reports, presented using a common template, ensured consistency and alignment.

A case study analysis approach was applied to process and analyze the contents of the teachers' reports. The data provided by each teacher was consolidated into individual case study briefs. A subsequent cross-case study analysis was conducted to identify differences, similarities, patterns, and insights for future research. The results were evaluated based on their alignment with the EU Green Competences Framework, the effectiveness of the activities in promoting sustainability, and the engagement and feedback from students.

Key criteria were applied to evaluate the reports submitted by teachers. First, completeness and accuracy were ensured by checking that all sections were fully completed and verifying details on the reported period, teacher's profile, and contact information. The quality of the activities was evaluated based on detailed descriptions, including objectives, duration, and resources used, ensuring alignment with sustainability and environmental education goals. Learning outcomes were documented by assessing the achievements and engagement of pupils in green topics, along with their levels of motivation and interest. The alignment with the Green Competences Framework was examined by identifying and integrating the targeted green competences. Furthermore, the effectiveness of the evaluation methods described in the reports was analyzed, and recommendations for further development were reviewed for practicality and quality.

The data provided in each report was consolidated into individual case study briefs. A subsequent cross-case study analysis was conducted to identify differences, similarities, patterns, and insights for future research.

Findings

Case Studies Overview

Case Study 1

Background: A primary teacher with 2 years of experience from a school in Sofia led the implementation of green education activities. The teacher's contact

information and personal details have been anonymized for privacy. The pilot involved 24 students aged 7 – 8 years old in the first grade.

Activities implemented: The students engaged in a recycling project, nature observation walks, and energy-saving campaigns. These activities increased the students' knowledge of ecological principles and instilled enthusiasm for participating in sustainable practices. The activities were effectively linked to the national curriculum, enhancing interdisciplinary learning and promoting systems thinking among students.

Outcomes and evaluation: The teacher observed that students developed critical thinking and problem-solving skills related to environmental issues. Behavioral changes were noted, with students adopting more sustainable practices both in school and at home. The evaluation methods included initial assessment (Good - 4), ongoing observations, and a final assessment (Excellent – 5.50).

Case Study 2

Background: Two primary teachers with 9 and 2 years of experience, respectively, from a secondary school in Samokov collaborated on the green education initiative. The pilot involved 22 students aged 8 – 9 years old in the second grade.

Activities implemented: The activities included presentations on nature, a visit to a waste disposal center, a treasure hunt game for waste sorting, making bird feeders, planting flowers, and nature photography. These hands-on activities fostered ecological awareness and responsible behavior among students.

Outcomes and evaluation: Students demonstrated increased interest in eco-friendly behavior. The evaluation was based on process-based assessment, highlighting improvements in environmental awareness and active participation.

Case Study 3

Background: A primary teacher with 4 years of experience from a school in Pazardzhik led the pilot involving 26 students in the second grade.

Activities implemented: The students crafted items from recycled materials, created a collage titled “Green Bulgaria”, and participated in lessons on environmental conservation. These activities encouraged creative reuse of waste materials and raised awareness about ecological issues.

Outcomes and evaluation: Students improved their recycling habits and environmental awareness, showing interest in green education topics. The evaluation included combined assessment through discussions, observations, and projects.

Case Study 4

Background: A senior primary teacher with 30 years of experience from a school in Plovdiv led the pilot involving 45 students aged 10 – 11 years old in the third and fourth grades.

Activities implemented: Activities included cleaning the school yard, lessons on World Water Day and Earth Day, biodiversity studies, recycling week, waste bin

decoration, a reuse workshop, a tree of life project, energy and water conservation tips, a nature photo exhibition, and an electronic book on water. These activities developed visual literacy, environmental awareness, and voluntary participation in green initiatives.

Outcomes and evaluation: Students gained knowledge about biodiversity and developed a sense of responsibility towards environmental conservation. The evaluation methods included questionnaires, surveys, and project competitions.

Case Study 5

Background: A primary teacher with 30 years of experience from a school in Sofia led the pilot involving 24 students aged 7 years old in the first grade.

Activities implemented: Activities included tree planting, a mountain clean-up, food waste reduction initiatives, environmental presentations, participation in an information campaign, and creating eco-signage. These activities promoted environmental responsibility and knowledge of pollution sources.

Outcomes and evaluation: Students adopted sustainable practices, recognized their role in environmental protection, and developed knowledge about European environmental policies. The evaluation was conducted through ongoing assessment during activities and projects.

Case Study 6

Background: A primary teacher with 1 year and 8 months of experience from a school in Kladnitsa led the pilot involving 16 students in the second and fourth grades.

Activities implemented: The students participated in a role-playing game that traced the journey of food from seed to consumption and disposal, emphasizing sustainable practices at each stage. The activity aimed to teach the importance of reducing waste and promoting recycling.

Outcomes and evaluation: Students demonstrated an understanding of the food supply chain, the environmental impacts of transportation, and developed sustainable solutions. The evaluation was based on observation during activities and included assessment of participation, motivation, and knowledge acquisition.

Cross-Case Analysis

Across the case studies, there was a high level of student engagement and motivation in green activities, regardless of geographical location. Students developed practical ecological skills and knowledge, resulting in positive behavioral changes towards environmental stewardship. Activities that involved hands-on, practical experiences, such as recycling projects, nature walks, and environmental games, were particularly effective in fostering ecological awareness.

The choice of green activities implemented by teachers appears to be influenced by the geographical context in which they operate. For example, in urban schools (Sofia and Plovdiv) these activities often focused on addressing urban ecological challenges such as waste management, pollution reduction, and promoting

sustainable urban living. Students in these areas were engaged in lessons that dealt directly with the immediate environmental issues they encounter daily. At the same time schools in mountainous regions (Samokov and Kladnitsa) utilized their natural surroundings for activities like tree planting and mountain clean-ups, emphasizing direct interaction with the environment. The focus was on conservation, biodiversity, and sustainable land use, which are more pertinent to their local contexts.

From the data, there was a noticeable correlation between the grade/age of pupils and the types of activities tested. Younger students, particularly those in 1st and 2nd grades, were more engaged in hands-on, creative activities that were simpler and more direct. For example, in case study 1, 1st-grade students participated in recycling projects, nature observation walks, and energy-saving campaigns. Similarly, in case study 2, 2nd-grade students engaged in presentations on nature, a visit to a waste disposal center, a treasure hunt game for waste sorting, making bird feeders, planting flowers, and nature photography.

In contrast, older students in 3rd and 4th grades participated in more complex activities requiring higher levels of cognitive engagement and responsibility. For instance, in case study 4, 3rd and 4th-grade students were involved in detailed studies on biodiversity, school yard cleaning, lessons on World Water Day and Earth Day, recycling week activities, waste bin decoration, a reuse workshop, a tree of life project, energy and water conservation tips, a nature photo exhibition, and creating an electronic book on water. In case study 6, 2nd and 4th-grade students were involved in role-playing games that simulated the food supply chain and waste disposal processes, which also required a higher level of engagement and understanding.

Case Study 2 provided data linked to collaboration between teachers, since two teachers from the same school collaborated to deliver the green education activities. This collaboration allowed for a broader range of activities and shared expertise, which enhanced the learning experience for the students. The teachers were able to cover more ground by combining their efforts, providing a more comprehensive and varied educational program. This interrelation also facilitated peer learning among students, as they were exposed to different teaching styles and methods.

Conclusions

The findings highlight the importance of tailoring green education to the specific geographical and environmental context of each school. Urban schools might focus on waste management, pollution reduction, and sustainable urban living, while rural and mountainous schools could emphasize biodiversity, conservation, and sustainable land use. The correlation between age/grade and the complexity of activities suggests that educational programs should be age-appropriate, gradually increasing in complexity as students advance. Ongoing professional development for teachers in green education is essential to keep them updated with the latest practices and methodologies. Encouraging community involvement and support for

school-based environmental initiatives can amplify the impact of these programs.

Future research could include longitudinal studies to track the long-term impact of green education across different geographical settings. Comparative studies could further explore how location-specific factors influence the effectiveness of green education programs. Developing standardized assessment tools for evaluating ecological competences across various contexts is recommended to ensure consistent and comprehensive evaluation.

The pilot program in Bulgaria demonstrated the potential of green education to foster environmental awareness and sustainable practices among primary school students across diverse geographical contexts. The positive outcomes and valuable feedback from teachers highlight the need for ongoing support and development in this area. By building on these initial successes, we can continue to empower teachers and students to become proactive agents of change, contributing to a more sustainable future.

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NOTES

1. Ordinance № 13 for civic, health, ecological and intercultural education, Ministry of Education and Science, Bulgaria, 2016, https://mon.bg/upload/16793/ndbr13_2016_GZEIObrazovanie_280918.pdf
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