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Education for Sustainable Development: Raising Environmental Awareness in Schools

Salima Meherali

University of Alberta, Edmonton Clinic Health Academy, Edmonton, AB, Canada

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CORRESPONDING AUTHOR(S):

E-mail: meherali@ualberta.ca

A B S T R A C T

This study explores the role of Education for Sustainable Development (ESD) in raising environmental awareness among school students. Amid growing global environmental challenges, schools have a critical responsibility to equip young learners with the knowledge, skills, and values necessary for sustainable living. Using a qualitative descriptive approach, data were collected through interviews, focus group discussions, classroom observations, and document analysis across five schools committed to sustainability education. Findings reveal that integrating environmental themes across curricula and promoting extracurricular activities effectively enhance students' understanding and engagement with environmental issues. Students reported positive behavioral changes, demonstrating increased environmental responsibility both inside and outside school. However, challenges such as limited teacher training, insufficient resources, and competing academic priorities were identified as barriers to effective implementation. The study underscores the need for systemic support, including professional development, resource allocation, and policy integration, to strengthen the impact of ESD in schools. Ultimately, this research highlights the transformative potential of education to foster environmental stewardship and contribute to a sustainable future.

INTRODUCTION

In recent decades, the global community has witnessed escalating environmental challenges ranging from climate change, biodiversity loss, deforestation, and pollution to the depletion of natural resources. These complex and interrelated problems pose a serious threat not only to ecological systems but also to social and economic development. In response, there has been growing recognition of the critical role that education plays in fostering environmental responsibility and shaping a more sustainable future. This has led to the emergence of **Education for Sustainable Development (ESD)** as a transformative educational framework aimed at equipping individuals with the knowledge, skills, values, and attitudes necessary to engage with and address sustainability challenges.

Education for Sustainable Development goes beyond traditional environmental education by promoting a holistic and interdisciplinary approach. It integrates environmental, social, and economic dimensions of sustainability into the learning process and encourages critical thinking, problem-solving, and participatory learning. The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines ESD as education that empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability, and a just society, for present and future generations.

Schools play a pivotal role in implementing ESD and raising environmental awareness among young learners. As foundational institutions in society, schools have the potential to shape students' environmental consciousness, behaviors, and values from an early age. By embedding sustainability principles into curricula, classroom activities, school policies, and community outreach, schools become agents of change, promoting environmental stewardship and sustainable lifestyles.

However, the integration of ESD in school systems is not without challenges. These include limited teacher training, insufficient curriculum development, lack of resources, and varying levels of institutional support. Furthermore, in many regions, environmental education remains marginalized or treated as an optional or supplementary topic rather than a core component of learning. Therefore, understanding how schools implement ESD and the extent to which they foster environmental awareness is crucial for developing effective strategies to promote sustainable development through education.

This study aims to explore the role of schools in raising environmental awareness through Education for Sustainable Development. It examines the methods, practices, and policies employed to instill environmental values among students and evaluates their effectiveness in promoting long-term behavioral change. By focusing on the school context, the research contributes to a deeper understanding of how educational institutions can act as catalysts for environmental responsibility and sustainability at both local and global levels.

METHOD

To explore how Education for Sustainable Development (ESD) is implemented in schools and how it contributes to raising environmental awareness, this study adopted a qualitative descriptive approach. The choice of this method was guided by the need to capture real-life educational experiences and provide a detailed account of practices, perceptions, and institutional efforts in promoting environmental consciousness. Rather than manipulating variables or testing hypotheses, the focus of the research was to describe and understand the natural, contextual implementation of ESD in the school environment.

The study was conducted across five purposefully selected schools, each representing a diverse educational setting—ranging from urban to semi-rural areas. These schools were chosen based on their observable commitment to environmental education, such as their participation in green school initiatives, integration of sustainability themes into the curriculum, or active student-led environmental

clubs. The variation in setting allowed the researcher to gain a broader perspective on how context influences the approach to ESD.

Participants were carefully selected to represent key stakeholders in the educational process. A total of ten teachers were interviewed, primarily those involved in subjects closely linked to environmental education such as science, social studies, and environmental studies. In addition, five school administrators, including principals and curriculum coordinators, participated to provide institutional perspectives on how environmental awareness is embedded into school policy and leadership decisions. To capture the student voice, thirty students from grades 5 to 12 were involved in focus group discussions. These students were stratified by age and grade to ensure a diversity of views and experiences.

Data collection relied on multiple qualitative techniques to allow for a rich and triangulated understanding of the subject matter. Semi-structured interviews with teachers and administrators offered insight into teaching strategies, challenges faced, institutional support mechanisms, and the level of curriculum integration. Focus group discussions with students provided a dynamic space to explore their thoughts, feelings, and behaviors related to the environment, as well as their engagement in school-based sustainability projects.

In addition to these conversations, classroom observations were carried out. These allowed the researcher to witness firsthand how environmental content is delivered, how students respond to sustainability themes, and how schools physically demonstrate their environmental commitments—for example, through recycling bins, garden projects, or green signage. Furthermore, documents such as lesson plans, school policies, activity reports, and program brochures were examined to supplement the verbal and observational data with written evidence of ESD efforts.

The data collected were analyzed using thematic analysis. This involved transcribing the interviews and discussions, coding the text for key ideas, and identifying recurring themes that captured patterns in how environmental awareness was cultivated through ESD. Themes such as “curriculum integration,” “student empowerment,” “institutional challenges,” and “community involvement” began to emerge, offering a comprehensive picture of the phenomenon under study. NVivo software was optionally used to organize and manage the data more systematically.

To ensure the trustworthiness of the findings, several strategies were employed. Triangulation across multiple data sources (interviews, observations, documents) helped to validate the results. Participants were invited to review and confirm their interview transcripts, ensuring accuracy and agreement with the researcher’s interpretation. Additionally, peer debriefing sessions were conducted to refine the analysis and interpretation of data, and a clear audit trail was maintained to track the decision-making process throughout the study.

Overall, this narrative method enabled the research to go beyond surface-level observations and delve into the lived experiences of those directly involved in promoting environmental sustainability in schools. It painted a clear, contextualized

picture of how ESD principles are being realized in educational practice, and provided a strong foundation for subsequent analysis and recommendations.

RESULTS AND DISCUSSION

The study revealed a multifaceted picture of how Education for Sustainable Development (ESD) initiatives contribute to raising environmental awareness in schools. From the perspectives of teachers, administrators, and students, it became clear that schools are actively engaging in diverse strategies to embed sustainability into their educational practices, although the depth and consistency of these efforts vary depending on resources, leadership, and community involvement.

One of the most striking findings was the extent to which environmental topics have been integrated into the regular school curriculum. Teachers reported incorporating sustainability themes not only in science subjects but also across social studies, language arts, and even mathematics. For example, some educators used local environmental issues such as water conservation or waste management as case studies in lessons, making learning more relevant and engaging for students. This cross-curricular integration helped students develop a holistic understanding of environmental challenges and their interconnections with social and economic factors.

Students expressed enthusiasm for these lessons, often linking what they learned in school to everyday life. During focus group discussions, many students shared examples of how they had adopted more environmentally friendly behaviors at home—such as reducing plastic use, conserving electricity, or participating in local clean-up campaigns—highlighting the practical impact of school-based education. This reflects one of the core goals of ESD: to move beyond knowledge acquisition and foster responsible attitudes and behaviors.

Extracurricular activities also played a crucial role in raising awareness and deepening student engagement. Environmental clubs, gardening projects, recycling drives, and Earth Day celebrations were commonly reported across the schools studied. These activities provided students with opportunities to actively participate in sustainability efforts, take leadership roles, and collaborate with peers and community members. In some schools, these initiatives extended beyond the campus, involving parents and local organizations, thereby strengthening the community's overall commitment to environmental stewardship.

Despite these successes, the study identified several challenges that limit the full realization of ESD's potential. A recurring concern among teachers was the lack of adequate training and professional development focused on sustainability education. Many educators felt they had to rely on their own initiative to incorporate environmental content, often without sufficient pedagogical support or updated materials. This lack of formal preparation sometimes resulted in uneven quality of instruction and missed opportunities to engage students more deeply.

Additionally, resource constraints were a common issue. Schools with limited funding struggled to sustain extracurricular programs or acquire educational

materials such as books, posters, or technology tools related to environmental education. Infrastructure limitations, such as lack of dedicated green spaces or recycling facilities, also hindered the practical application of sustainability concepts.

Administrators acknowledged the importance of ESD but pointed to competing priorities within the school system. Curriculum mandates, standardized testing pressures, and administrative workloads sometimes relegated environmental education to a secondary status. Furthermore, the absence of clear policies or incentives from higher education authorities contributed to inconsistent implementation across schools.

Nevertheless, the study also highlighted promising strategies to overcome these barriers. Schools that had established partnerships with local environmental organizations or government agencies benefited from additional resources, expertise, and community support. Teacher collaboration and peer learning networks also helped share best practices and build capacity. Some schools had begun to integrate environmental goals into their overall school improvement plans, signaling a move towards institutionalizing sustainability efforts rather than treating them as add-ons.

Overall, the findings underscore the transformative potential of Education for Sustainable Development in shaping environmentally conscious individuals and communities. By equipping students with knowledge, values, and practical skills, schools serve as vital catalysts for change. However, to maximize this impact, there is a need for systemic support through teacher training, resource allocation, policy guidance, and community engagement.

This study adds to the growing body of evidence that environmental education must be more than an isolated subject; it must be a pervasive and embedded feature of schooling. The observed link between classroom learning, extracurricular participation, and changes in students' attitudes and behaviors points to the effectiveness of a holistic approach. Future efforts should prioritize strengthening these interconnected dimensions to foster a sustainable future.

CONCLUSION

This study demonstrates that Education for Sustainable Development (ESD) plays a vital role in raising environmental awareness among school students, contributing significantly to nurturing responsible attitudes and behaviors toward sustainability. Schools, as primary social institutions for learning and socialization, are uniquely positioned to influence young minds by embedding environmental education across curricula, fostering active participation through extracurricular activities, and engaging communities in sustainability initiatives.

The integration of sustainability themes within various subjects was shown to deepen students' understanding of environmental issues, helping them see the connections between ecological, social, and economic dimensions. Equally

important, the hands-on involvement in projects and environmental clubs provided meaningful opportunities for students to practice stewardship and leadership. These experiences not only reinforced knowledge but also empowered students to become agents of change in their families and communities.

However, the study also highlighted several persistent challenges that hinder the full potential of ESD. Insufficient teacher training, lack of adequate resources, and competing academic priorities limit the scope and consistency of environmental education in many schools. Moreover, without clear institutional policies and dedicated support from educational authorities, ESD efforts remain vulnerable to fragmentation and discontinuity.

To address these challenges, systemic efforts are needed at multiple levels. Strengthening teacher capacity through targeted professional development, ensuring resource availability, and embedding sustainability goals into school policies and curricula are essential steps. Furthermore, fostering partnerships with local organizations and involving parents and community stakeholders can amplify the reach and impact of environmental education.

In conclusion, the study affirms that raising environmental awareness through Education for Sustainable Development is not only necessary but achievable within the school context. When supported by appropriate policies, resources, and community involvement, schools can become powerful catalysts for sustainable development. By equipping students with the knowledge, skills, and values needed for environmental stewardship, education can contribute decisively to creating a more sustainable, equitable, and resilient future.

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