

THE IMPORTANCE OF ENVIRONMENTAL EDUCATION IN THE SCHOOL CONTEXT: AN INTEGRATIVE REVIEW

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ABSTRACT

Environmental education, integrated into the school environment, is an essential tool for developing conscious, critical citizens committed to environmental preservation. This study aims to analyze, through an integrative literature review, how environmental education has been implemented in Brazilian schools and the main challenges and strategies reported in recent years. Articles published between 2013 and 2023 were selected from the SciELO, BVS, and Google Scholar databases, using previously defined inclusion criteria. The results highlight the relevance of environmental education as a cross-curricular component, revealing innovative and participatory pedagogical practices. However, limitations are observed regarding teacher training, project continuity, and coordination with public policies. The conclusion is that, for environmental education to be effective, institutional commitment, ongoing teacher training, and the involvement of the school community are necessary.

Keywords: Environmental education; Schools; Sustainability; Pedagogical practices; Teacher training.

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INTRODUCTION

The environmental crisis afflicting the planet has intensified in recent decades due to an economic development model based on the excessive exploitation of natural resources and the logic of unrestrained consumption. Issues such as global warming, water scarcity, ecosystem pollution, and biodiversity loss directly affect the quality of life of populations and underscore the urgency of educational actions that promote a new relationship between society and nature (Reis et al., 2021).

In this context, environmental education (EE) emerges as an essential tool for addressing contemporary socio-environmental issues by encouraging critical reflection, behavioral change, and the development of an ethical and sustainable consciousness. EE goes beyond the transmission of ecological knowledge, proposing a continuous, transformative, and interdisciplinary educational process capable of mobilizing individuals to care for the environment and to engage in civic participation (Costa; Costa, 2024).

In Brazil, environmental education is supported by Law No. 9.795/1999, which establishes the National Environmental Education Policy and mandates its inclusion at all levels and modalities of education. This legislation represents a significant milestone in consolidating EE as a right for all and a duty of the State, recognizing the central role of educational institutions in shaping an environmentally responsible society (Brasil, 1999).

Therefore, schools are configured as privileged spaces for the development of environmental education. It is within this environment that children, adolescents, and young people can be sensitized to the importance of environmental preservation and encouraged to become transformative agents of reality. The school has the potential to integrate scientific knowledge, ethical values, and social practices, promoting integrative and contextualized pedagogical projects (Müller; Silva, 2023).

Recent studies indicate that the presence of environmental education in schools has increased, especially through initiatives such as school gardens, recycling projects, climate education, and interdisciplinary actions (Almeida, 2022). However, significant challenges are also highlighted, such as the lack of ongoing teacher training, the absence of public incentive policies, and the difficulty in articulating theory and practice in everyday school life. Many teachers still feel unprepared to address environmental topics critically and integratively, limiting themselves to isolated content disconnected from the pedagogical project (Santos et al., 2020).

Despite these difficulties, various experiences have shown that when well-planned and executed, environmental education in the school environment contributes to strengthening student protagonism, developing socio-emotional skills, and building values based on empathy, solidarity, and respect for life (Leite et al., 2025). Furthermore, EE practices in the school context have been associated with



improvements in institutional climate, community mobilization, and the encouragement of collective actions in favor of sustainability (Muniz et al., 2025).

Given this, it becomes essential to analyze how environmental education has been effectively implemented in Brazilian schools, which pedagogical strategies have proven effective, and what the main challenges and advances in this field are. Based on these questions, the present study aims to conduct an integrative literature review on the importance of environmental education in the school environment, in order to contribute to the strengthening of educational practices that promote ecological awareness and the construction of more sustainable and just societies.

METHODOLOGY

This study is an integrative literature review, a methodology that allows for the synthesis of results from previously published research, enabling broader conclusions about a given phenomenon or problem (Souza et al., 2020). The integrative review consists of several stages, including: identifying the topic and formulating the research question, establishing inclusion and exclusion criteria, defining the information to be extracted, evaluating the included studies, interpreting the results, and presenting the review.

The guiding question of this review was: “What is the importance of environmental education in the school environment, according to recent scientific literature?” To answer this, searches were conducted in the following databases: Scientific Electronic Library Online (SciELO), Virtual Health Library (BVS), and Google Scholar, as they are widely used in the educational and multidisciplinary fields.

Data collection was carried out in May and June 2025, using the following descriptors combined with the Boolean operator “AND”: “educação ambiental” AND “escola” (environmental education AND school), “educação ambiental” AND “ensino” (environmental education AND teaching), and “educação ambiental” AND “educação básica” (environmental education AND basic education). The inclusion criteria were: articles published between 2019 and 2025, available in full, in Portuguese, that directly addressed environmental education in the Brazilian school context, with a focus on pedagogical, curricular, or training aspects. The exclusion criteria included: duplicate articles, works that did not directly address the theme of EE in schools, and non-scientific productions such as monographs and dissertations.

The selection of studies occurred in three stages: reading the titles, reading the abstracts, and finally, reading the full texts of the selected articles. The data extracted from each study were organized in a spreadsheet containing information such as: author, year of publication, study objective, methodology used, main results, and conclusions.

This methodological approach enabled the systematization of the available knowledge on the practice of environmental education in Brazilian schools, contributing to the identification of advances, challenges, and gaps in the recent scientific literature.

RESULTS AND DISCUSSION

The search conducted in the SciELO, BVS, and Google Scholar databases between 2019 and 2024 initially yielded 75 articles, of which 8 were selected for critical analysis (Table 01). These studies cover a variety of Brazilian educational contexts, especially at the elementary and secondary levels, and discuss pedagogical practices, teacher training, social impacts, institutional challenges, and public policies related to environmental education (EE).

Table 01: Articles selected for critical analysis

Authors	Year	Study Title	Objetivo	Main Findings
Carvalho et al.	2020	Educação ambiental na escola: uma análise da percepção discente [Environmental education at school: an analysis of student perception]	Analyze elementary students' perception of EE	Most students understand the importance of environmental preservation, but pedagogical practice remains superficial.
Ferreira e Santos	2020	O papel da educação ambiental nas escolas públicas [The role of environmental education in public schools]	Examine how EE is being implemented in public schools	EE is still treated in a fragmented and occasional manner, without effective integration into the curriculum.
Lima et al.	2021	Educação ambiental crítica e cidadania ecológica: um estudo em escolas do semiárido [Critical environmental education and ecological citizenship: a study in semi-arid schools]	Investigate the presence of critical EE in student formation	Critical EE promotes more conscious and active citizenship but faces institutional challenges.
Oliveira e Almeida	2021	Percepção ambiental e educação: experiências com alunos do ensino médio [Environmental perception and education: experiences with high school students]	Analyze EE experiences with high school students	Student interest was observed, but there is a lack of pedagogical support and appropriate participatory methodologies.
Pereira et al.	2022	Educação ambiental no contexto escolar: práticas e desafios [Environmental education in the school context: practices and challenges]	Investigate pedagogical practices and challenges faced by teachers	Many teachers are willing, but lack ongoing training and institutional support.
Rodrigues et al.	2023	A transversalidade da educação ambiental no currículo escolar [The cross-curricular nature of environmental education in the school curriculum]	Evaluate how EE is addressed cross-curricularly in the curriculum	Despite legal requirements, cross-curricular integration is still weak in practice, requiring more teacher training.
Silva e Rocha	2023	Sustentabilidade e práticas pedagógicas: um estudo de caso em escolas públicas [Sustainability and pedagogical practices: a case study in public schools]	Analyze sustainability practices developed by teachers in public schools	Teacher leadership stands out, but the lack of systematic school policies hinders continuity of actions.
Souza et al.	2024	Environmental education and social transformation: a qualitative study in communities	Investigate EE's contribution to socio-environmental transformation in schools	Well-conducted EE projects contribute to collective engagement and changes in environmental perception among students and families.

Source: authors, 2025.



ACTIVE AND INNOVATIVE METHODOLOGIES FOR ENVIRONMENTAL EDUCATION

The studies demonstrate that the implementation of active methodologies in environmental education (EE), such as practical and interdisciplinary projects, is crucial for engaging students and facilitating the understanding of socio-environmental topics. Activities such as school gardens, recycling workshops, the creation of educational materials, and field trips to green areas are widely used to bring students closer to environmental realities and to encourage socio-environmental responsibility (Gomes; Pereira, 2021; Oliveira et al., 2022; Santos et al., 2023).

Additionally, the growing use of digital technologies—such as educational apps, interactive platforms, and environmental games—is noteworthy. These tools expand access to information and promote collaborative learning. They also support the contextualization of content and stimulate youth protagonism by allowing students to explore local and global environmental issues with autonomy (Lima; Fernandes, 2023).

Practical examples, such as the school composting project reported by Silva and Souza (2023), demonstrate benefits not only for learning but also for the environmental sustainability of the school itself, by reducing waste and promoting conscious consumption. In this way, linking curricular content to concrete actions helps consolidate meaningful learning and develop socio-emotional skills.

TEACHER TRAINING: CAPACITATION, CHALLENGES, AND DEMANDS

Teacher training is identified as one of the pillars for the success of environmental education. Several articles highlight the lack of continuous and specific training, which limits teachers' ability to integrate environmental concepts into the curriculum and apply innovative methodologies. This gap often results in fragmented and superficial approaches, where EE is addressed sporadically and without interdisciplinary articulation. Martins and Almeida (2020) point out that the absence of adequate training can generate insecurity among teachers and limit the effectiveness of environmental practices. In turn, Lima and Fernandes (2023) emphasize the need for training that fosters dialogue between scientific, pedagogical, and cultural knowledge, enabling a critical and contextualized approach (Martins; Almeida, 2020; Lima; Fernandes, 2023; Pereira; Souza, 2024).

Moreover, the lack of didactic resources, materials, and institutional support are frequently cited challenges in the analyzed studies, revealing a significant barrier to the consolidation of consistent pedagogical practices in environmental education. The shortage of appropriate materials—such as books, booklets, laboratories, and green spaces—limits the development of interactive and contextualized activities. Added to this is the overload of teachers' work and the absence of institutional incentives, which demotivate educators from systematically incorporating environmental themes into the curriculum (Santos et al., 2020; Silva & Andrade, 2021).



Several studies indicate that without concrete support from educational institutions and managing bodies, EE tends to remain a sporadic and peripheral approach. In this context, the role of public policies is emphasized as fundamental to ensure resources, adequate infrastructure, partnerships with universities and environmental organizations, as well as continuing education programs that value and strengthen EE in schools. When such policies are effectively implemented, greater teacher engagement, interdisciplinarity, and transformative actions in the school routine are observed (Gonçalves & Melo, 2022; Rodrigues et al., 2023; Almeida et al., 2023).

IMPACTS OF ENVIRONMENTAL EDUCATION ON CITIZENSHIP AND THE COMMUNITY

It is also important to emphasize that environmental education has a strong impact on the civic formation of students, promoting values such as solidarity, empathy, critical thinking, and social responsibility. Ferreira et al. (2022) show that active participation in environmental projects strengthens students' bonds with the school community and broadens social mobilization, encouraging collective actions for environmental preservation and conservation. The extension of these actions beyond the school, involving family members and neighbors, is a distinguishing factor that enhances the reach of environmental education (Mendes et al., 2023).

Awareness of local environmental problems—such as inadequate waste management and the preservation of natural resources—generates critical consciousness that can translate into more sustainable daily practices. Furthermore, EE contributes to the construction of a culture of peace and respect for socio-environmental diversity, which are fundamental for coexistence in complex and multicultural societies (Leite et al., 2025).

PUBLIC POLICIES AND THE INSTITUTIONAL ROLE

Law No. 9.795/1999 remains the main legal reference for environmental education in Brazil; however, its practical implementation still faces barriers. Studies indicate that the commitment of education departments, school management, and state governments is crucial for the legislation to be translated into concrete and structured actions (Souza et al., 2021; Gonçalves; Melo, 2022).

Furthermore, the lack of coordination between public policies, school programs, and teacher training hinders the continuity of EE projects and their systematic integration into the curriculum. Rodrigues et al. (2023) highlight the importance of collaborative networks among schools, universities, and civil society organizations to strengthen environmental education and facilitate the exchange of successful experiences.



STRUCTURAL CHALLENGES AND IMPROVEMENT PROPOSALS

The structural challenges range from the lack of adequate infrastructure and pedagogical materials to teacher overload and the low prioritization of environmental education (EE) in schools (Pereira; Souza, 2024; Rodrigues et al., 2023). To overcome these obstacles, the literature suggests the need for integrated policies that ensure specific funding for EE, high-quality continuing education, and the development of contextualized and innovative methodologies.

Another relevant point is the strengthening of engagement from the school community and families, which can enhance the effects of EE and ensure its long-term sustainability (Mendes et al., 2023). The integration between formal education and community practices can be an effective path to broaden students' understanding of the importance of sustainability. Furthermore, the incorporation of new digital technologies, combined with participatory methodologies and interdisciplinary projects, represents a promising perspective for modernizing EE, making it more attractive, dynamic, and effective (Oliveira et al., 2022; Lima; Fernandes, 2023).

CONCLUSION

Based on the integrative review conducted, it was possible to observe that environmental education plays a fundamental role in the school context, not only as a curricular component but as a transformative instrument of students' socio-environmental awareness. Active pedagogical practices involving concrete experiences—such as school gardens, recycling projects, and the use of digital technologies—prove to be effective strategies for promoting engagement and civic formation.

However, the effectiveness of these practices is closely linked to teacher training, which is shown to be insufficient and fragmented in many contexts, reflecting the need for more robust public policies and investments in the continuous professional development of educators. The lack of adequate infrastructure and appropriate pedagogical resources constitutes a challenge that must be addressed to consolidate environmental education as a cross-cutting axis in schools.

The socio-environmental impacts of environmental education go beyond the school environment, reaching the community and contributing to the formation of critical, responsible citizens committed to sustainability. The active participation of students in environmental projects fosters the development of ethical values, critical awareness, and a sense of belonging—essential elements for building more just and sustainable societies.

Therefore, for environmental education to reach its transformative potential, it is essential to establish effective articulation among public policies, school management, teacher training, and the engagement of the school community. Strengthening these dimensions can ensure the continuity, depth,



and reach of environmental practices, promoting sustainability as a central value of Brazilian basic education.

Finally, the importance of future research is highlighted—research that evaluates the long-term impact of environmental education interventions, expands the investigation of innovative methodologies, and explores the integration of schools with the community and territory, consolidating environmental education as an indispensable tool for addressing the socio-environmental challenges of the 21st century.



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