INTEGRATING ENVIRONMENTAL EDUCATION AND SOCIAL INCLUSION: CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE LEARNING

INTEGRAÇÃO DA EDUCAÇÃO AMBIENTAL E DA INCLUSÃO SOCIAL: DESAFIOS E OPORTUNIDADES PARA A APRENDIZAGEM SUSTENTÁVEL

INTEGRACIÓN DE LA EDUCACIÓN AMBIENTAL Y LA INCLUSIÓN SOCIAL: RETOS Y OPORTUNIDADES PARA EL APRENDIZAJE SOSTENIBLE

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ABSTRACT

Integrating Environmental Education into basic education is vital to fostering critical, sustainability-oriented citizenship. Active and interdisciplinary approaches enhance inclusion and environmental literacy, though limited resources and teacher training remain key challenges. Thus, this study aims to analyze how environmental education and social inclusion are integrated into basic education, identifying global strategies, national approaches, and challenges for achieving sustainable and inclusive learning through an integrative literature review. An integrative literature review was conducted using SciELO, CAPES, and official documents from the UN, UNESCO, MEC, BNCC, and CNE. Studies published between 2000 and 2025 were analyzed, focusing on recent discussions on environmental education, social inclusion, and the SDGs. Critical and interdisciplinary approaches guided the selection, enabling the identification of theoretical trends and challenges in integrating Environmental Education into basic education. The results show that integrating Environmental Education with Inclusive Education is essential to strengthen democratic and sustainability-oriented public schools. Interdisciplinary practices, accessible technologies, and partnerships between schools, communities, and public policies enhance meaningful learning and socio-environmental citizenship. However, progress in this integration depends on continuous teacher training, institutional support, and the effective inclusion of environmental themes in school curricula. It is recommended to reinforce education policies aligned with the SDGs to consolidate a sustainable, equitable, and transformative basic education system.

Keywords: Environmental Education. Social Inclusion. Sdgs. BNCC. Public Schools.

RESUMO

A integração da Educação Ambiental na educação básica é vital para o desenvolvimento de uma cidadania crítica e orientada para a sustentabilidade. Abordagens ativas e interdisciplinares promovem a inclusão e a alfabetização ambiental, embora a limitação de

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recursos e a formação de professores continuem sendo desafios cruciais. Assim, este estudo visa analisar como a educação ambiental e a inclusão social são integradas à educação básica, identificando estratégias globais, abordagens nacionais e desafios para alcançar uma aprendizagem sustentável e inclusiva por meio de uma revisão integrativa da literatura. Uma revisão integrativa da literatura foi conduzida utilizando as bases de dados SciELO, CAPES e documentos oficiais da ONU, UNESCO, MEC, BNCC e CNE. Estudos publicados entre 2000 e 2025 foram analisados, com foco em discussões recentes sobre educação ambiental, inclusão social e os ODS. Abordagens críticas e interdisciplinares orientaram a seleção, permitindo a identificação de tendências teóricas e desafios na integração da Educação Ambiental na educação básica. Os resultados mostram que a integração da Educação Ambiental com a Educação Inclusiva é essencial para fortalecer escolas públicas democráticas e orientadas para a sustentabilidade. Práticas interdisciplinares, tecnologias acessíveis e parcerias entre escolas, comunidades e políticas públicas promovem uma aprendizagem significativa e a cidadania socioambiental. No entanto, o progresso nessa integração depende da formação contínua de professores, do apoio institucional e da inclusão efetiva de temas ambientais nos currículos escolares. Recomenda-se o reforço de políticas educacionais alinhadas aos ODS para consolidar um sistema de educação básica sustentável, equitativo e transformador.

Palavras-chave: Educação Ambiental. Inclusão Social. ODS. BNCC. Escolas Públicas.

RESUMEN

Integrar la educación ambiental en la educación básica es fundamental para fomentar una ciudadanía crítica y orientada a la sostenibilidad. Los enfoques activos e interdisciplinarios mejoran la inclusión y la alfabetización ambiental, si bien la escasez de recursos y la falta de formación docente siguen siendo desafíos clave. Por ello, este estudio analiza cómo se integran la educación ambiental y la inclusión social en la educación básica, identificando estrategias globales, enfoques nacionales y desafíos para lograr un aprendizaje sostenible e inclusivo mediante una revisión bibliográfica integradora. Dicha revisión se realizó utilizando SciELO, CAPES y documentos oficiales de la ONU, la UNESCO, el Ministerio de Educación y Cultura (MEC), la Comisión Nacional de Cambio Climático (BNCC) y el Consejo Nacional de Educación (CNE). Se analizaron estudios publicados entre 2000 y 2025, centrándose en los debates recientes sobre educación ambiental, inclusión social y los ODS. La selección se basó en enfoques críticos e interdisciplinarios, lo que permitió identificar tendencias teóricas y desafíos en la integración de la educación ambiental en la educación básica. Los resultados muestran que integrar la educación ambiental con la educación inclusiva es esencial para fortalecer las escuelas públicas democráticas y orientadas a la sostenibilidad. Las prácticas interdisciplinarias, las tecnologías accesibles y las alianzas entre escuelas, comunidades y políticas públicas mejoran el aprendizaje significativo y la ciudadanía socioambiental. Sin embargo, el progreso en esta integración depende de la formación continua del profesorado, el apoyo institucional y la inclusión efectiva de temas ambientales en los currículos escolares. Se recomienda reforzar las políticas educativas alineadas con los ODS para consolidar un sistema de educación básica sostenible, equitativo y transformador.

Palabras clave: Educación Ambiental. Inclusión Social. ODS. BNCC. Escuelas Públicas.

1 INTRODUCTION

Integrating environmental education (EE) and social inclusion into basic education has emerged as a global priority for achieving sustainable learning and equitable development. International frameworks, such as the United Nations' 2030 Agenda and UNESCO's Education for Sustainable Development (ESD), emphasize that education must not only transmit knowledge but also foster critical awareness, ethical values, and the capacity to act responsibly in the face of environmental and social challenges (UNITED NATIONS, 2015; RIECKMANN, 2017; UNESCO, 2017). Effective integration of EE involves linking ecological literacy with inclusion, ensuring that all learners (regardless of background or ability) participate actively in sustainability-oriented education (SANTOS; OLIVEIRA, 2023; SHARMA, 2025).

Recent studies highlight that active, experiential, and community-based approaches strengthen students' engagement and sense of belonging, promoting both environmental responsibility and social justice (AZMI et al., 2024; CIOBOTARU & ANDRONACHE, 2024; CADENA & BELTRÁN, 2025). Within this global perspective, schools are increasingly recognized as key spaces for building sustainable mindsets and inclusive practices, capable of connecting environmental understanding to collective transformation (SHARMA, 2025).

In Brazil, the National Environmental Education Policy (Law No. 9,795/1999) established Environmental Education (EE) as a permanent, interdisciplinary, and participatory process. In parallel, the Brazilian Law for the Inclusion of Persons with Disabilities (Law No. 13,146/2015) and the National Common Curricular Base (BNCC) reinforced an educational model focused on equity and holistic development. Classical critical literature (JACOBI, 2003; LOUREIRO, 2004; SAUVÉ, 2005; MORIN, 2000) had already advocated for an emancipatory form of EE, intrinsically linked to citizenship. Recent studies have updated this debate by highlighting the central role of public schools in developing socio-environmental and climate-related competencies (BUSTAMANTE et al. 2025).

Accordingly, this literature review is justified by the growing need to understand how educational systems can bridge environmental and social dimensions to respond effectively to global sustainability challenges and promote equity in learning opportunities (Rieckmann, 2017). Thus, this study aims to analyze how environmental education and social inclusion are integrated into basic education, identifying global strategies, national approaches, and challenges for achieving sustainable and inclusive learning through an integrative literature review.

2 METODOLOGY

2.1 INTEGRATED LITERATURE REVIEW METHODOLOGY

An integrative literature review was conducted following the methodological framework proposed by Whittemore and Knafl (2005). The search was performed in the SciELO and CAPES databases, as well as in official documents from the United Nations (AGENDA, 2030), UNESCO, the Brazilian Ministry of Education (MEC), the National Common Curricular Base (BNCC), and the National Education Council (CNE). The selection included studies published between 2000 and 2025, with greater emphasis on the period 2020–2025, due to the growing international and national discussions on sustainability and inclusive education.

The search strategy employed the descriptors “environmental education,” “social inclusion,” “SDGs,” “BNCC,” and “public school,” combined with the Boolean operators “AND,” “OR,” and “NOT.” The inclusion criteria were: thematic relevance to the relationship between school education, environmental education, and inclusion; a critical or interdisciplinary approach; and both empirical and theoretical studies. The exclusion criteria were: studies with a technical or sectoral focus that lacked an educational interface.

The material obtained was organized by topic and year of publication to identify theoretical trends, main themes, and methodological approaches, enabling a comprehensive understanding of how environmental education and social inclusion have been discussed and integrated into basic education over the past two decades.

3 RESULTS AND DISCUSSION

3.1 INTEGRATING ENVIRONMENTAL EDUCATION INTO CURRICULA

3.2 A GLOBAL PERSPECTIVE

Integrating environmental education (EE) into basic education curricula has become a global priority for fostering sustainable learning and preparing students to confront environmental challenges in an increasingly complex world. This integration transcends the transmission of ecological knowledge, aiming to develop critical thinking, social responsibility, and active citizenship. Effective strategies identified in recent studies emphasize the adoption of pedagogical approaches grounded in active learning, interdisciplinary integration, and community engagement, which together contribute to a more comprehensive and transformative understanding of sustainability (AZMI et al., 2024; SRIHARTINI et al., 2025).

Problem-based and project-based learning methodologies, for example, engage students in real-world environmental issues and encourage them to develop practical solutions. This process strengthens cognitive, affective, and psychomotor dimensions of learning, deepening students’ comprehension of sustainability principles (Azmi et al., 2024;

Srihartini et al., 2025). Participatory and experiential approaches, such as interactive games, fieldwork, and interdisciplinary projects, further connect theoretical content to lived experiences, fostering direct involvement in environmental protection (CIOBOTARU & ANDRONACHE, 2024).

From a curricular perspective, the interdisciplinary integration of sustainability across subjects enables the development of holistic and contextualized environmental literacy, bridging scientific, social, and ethical dimensions (Sharma, 2025). Moreover, incorporating indigenous and traditional ecological knowledge into educational frameworks provides students with diverse cultural perspectives and alternative pathways to understanding and addressing ecological challenges (SHARMA, 2025).

At the institutional and community level, successful integration of EE depends on strong partnerships. Community engagement in school-based environmental initiatives enhances social participation and strengthens collective responsibility for sustainability (CADENA & BELTRÁN, 2025). Equally important is continuous teacher training and capacity building, ensuring that educators are equipped with pedagogical tools and resources to effectively implement sustainability education (CADENA & BELTRÁN, 2025).

Despite these advances, significant barriers persist, including limited financial resources, curriculum overload, and institutional resistance to change. Overcoming these challenges requires policy advocacy, the strategic use of educational technologies, and ongoing monitoring and evaluation to ensure meaningful and lasting integration of environmental education into basic education systems worldwide (SHARMA, 2025).

3.3 A BRAZIL PERSPECTIVE

3.3.1 The development: from policy to critical pedagogy

The National Environmental Education Policy (Law No. 9,795/1999) established Environmental Education (EE) as a permanent, interdisciplinary, and participatory process aimed at building ethical values and promoting social transformation. Studies conducted by Jacobi (2003), Loureiro (2004), and Sauvé (2005) grounded EE in a critical perspective that seeks to overcome the conservationist and technicist model, articulating the social, political, and cultural dimensions of the environment.

According to Morin (2000), environmental education must address the complexity of reality, fostering individuals capable of thinking systemically and sustainably. Recent evidence reinforces the need to incorporate EE into basic education curricula. For instance, Graciani et al. (2025), in an integrative review of Brazil's New Secondary Education

framework, highlight the importance of aligning EE with socioemotional competencies and the learning pathways defined by the BNCC, thus bringing education closer to everyday life.

Similarly, Oliveira and Souza (2025) and Becher, Tavares, and Bujes (2024) observe that the ecocentric approach to EE (centered on the relationship between humans and nature) promotes planetary citizenship and critical thinking. Therefore, the evolution of EE reflects a transition from isolated, content-based practices to a critical, interdisciplinary, and contextualized socio-environmental field, aligned with the Sustainable Development Goals (SDGs).

3.3.2 Inclusive Education and Sustainability

The Brazilian Law for the Inclusion of Persons with Disabilities (Law No. 13,146/2015) establishes that education is a right for all and must occur in inclusive, accessible, and collaborative environments. For Dubet (2008), a just school is one that recognizes differences and combats inequalities, transforming diversity into a formative element. Monteiro et al. (2024), in a systematic review, confirm that the integration between inclusive and environmental education enhances the sense of belonging and collective engagement by linking social and ecological themes.

This interface is also highlighted by Valle et al. (2013), who demonstrate how assistive technologies and digital platforms expand the participation of students with disabilities in environmental education projects. Based on this evidence, it is understood that educational sustainability encompasses ethical and social dimensions, in which inclusion is a key condition for consolidating a democratic environmental culture.

3.3.3 Interdisciplinary pedagogical practices and the SDGs

Interdisciplinarity is identified as a structural axis of contemporary Environmental Education (EE). Dias (2010) and Sorrentino (1998) emphasize that practices such as school gardens, waste sorting, ecological fairs, and field study projects are fundamental for developing ecological awareness and youth protagonism. According to Sanchez (2023/2024), these initiatives strengthen the links between schools and communities, promoting social engagement and situated learning.

The integration between the Sustainable Development Goals (SDGs) and school curricula has advanced in Brazil. For example, Rosa and Silva (2024) identify that interdisciplinary projects contribute to the development of socio-environmental and technoscientific competencies, while Castro et al. (2025) report innovative experiences in climate education that connect teaching, service, and community engagement. These actions

address SDGs 4 (Quality Education), 11 (Sustainable Cities), 12 (Responsible Consumption), 13 (Climate Action), and 17 (Partnerships for the Goals), consolidating schools as transformative centers of sustainability.

3.3.4 Structural and pedagogical challenges and future perspectives

Structural and pedagogical barriers continue to hinder the consolidation of Environmental Education (EE) and inclusion in schools. These include insufficient teacher training, fragmented curricula, and a shortage of didactic resources (Lima, 2021; Sanchez, 2023/2024). Studies highlight the “non-place” of environmental training in basic education and the need for institutional alignment with the BNCC and EE curricular guidelines (NEPOMUCENO, 2021; BECHER, 2024). Lima and Gonçalves (2021) reinforce the lack of specific teacher preparation in EE and the persistent gap between educational policies and daily pedagogical practice, exacerbated by limited resources, reduced instructional time, and lack of institutional support.

Health and climate impacts underscore the urgency of incorporating climate-focused EE into everyday school activities (particularly in light of recent extreme events in Brazil) to protect children and adolescents and strengthen community resilience (BUSTAMANTE et al. 2025). Theses authors emphasize that climate change directly affects child health, highlighting the crucial role of schools in promoting adaptive and sustainable responses.

In line with this perspective, Milagre et al. (2025) and Shiroma and Evangelista (2025) argue that educational policies should adopt interdisciplinary and climate justice approaches, engaging multiple actors and territories. International perspectives and Brazilian educational debates also point to curricular reforms, stronger partnerships, and pedagogical innovation as key strategies for scaling up inclusive EE (SHIROMA, 2025). Overall, evidence suggests that the effectiveness of inclusive Environmental Education depends on the articulation between teacher training, public policies, and pedagogical innovation, combined with the appreciation of local culture and interinstitutional collaboration.

4 FINAL CONSIDERATIONS AND RECOMMENDATIONS

From a global perspective, integrating Environmental Education (EE) into basic education systems is essential for advancing sustainable development and preparing new generations to address interconnected environmental and social challenges. Countries that have progressed in sustainability education share common strategies (policy alignment, interdisciplinary curricula, teacher training, and community engagement) strengthening schools as laboratories of social and ecological transformation.

International frameworks such as the United Nations' 2030 Agenda and UNESCO's Education for Sustainable Development highlight that environmental literacy must be inclusive, participatory, and culturally relevant. Yet, disparities in resources, institutional capacity, and teacher preparation continue to create uneven implementation. Achieving global impact requires that EE move beyond isolated initiatives and become a systemic element of educational policy, linking environmental understanding with ethics, citizenship, and social justice.

Within this context, the Brazilian experience exemplifies both the challenges and the potential of aligning national educational reforms with global sustainability agendas. The integrated review indicates a convergence between legal frameworks, critical theory, and recent evidence: Environmental Education emerges as a structuring axis for an inclusive public school committed to sustainability.

The following recommendations are proposed in Brazil: (i) institutionalize continuous teacher training in EE and the SDGs; (ii) mainstream EE across the curriculum in alignment with the BNCC; (iii) ensure adequate material conditions and pedagogical time for project development; (iv) expand school–health–community partnerships; and (v) employ accessible technologies to enhance communication and student participation. The results indicate that when Environmental Education is integrated with Inclusive Education, it constitutes a field of convergence between ethics, citizenship, and sustainability.

The recent literature confirms that interdisciplinary practices, mediated by technology and guided by the SDGs, foster meaningful learning and community engagement, while also revealing ongoing implementation challenges. Therefore, strengthening public policies and continuous teacher training is essential to consolidate a sustainable, democratic, and inclusive public education system.

5 CONCLUSION

The study demonstrated that integrating Environmental and Inclusive Education in basic education enhances meaningful learning, equity, and community engagement. The global analysis indicated that coherent policies, teacher training, and interdisciplinary practices are key to advancing sustainable educational models. In Brazil, despite legal and curricular progress, challenges remain regarding implementation, resource limitations, and ongoing professional development. It is concluded that strengthening public policies, encouraging pedagogical innovation, and valuing the social and environmental dimensions of schooling are essential to making basic education an effective driver of sustainability and inclusion

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