



ENVIRONMENTAL EDUCATION AS A TOOL FOR THE FORMATION OF SUSTAINABLE CITIZENS



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ABSTRACT

Environmental education is a topic of great relevance in contemporary times, especially considering the environmental challenges that society faces. The choice of this theme is justified by the urgent need to train citizens who are more aware and responsible in relation to ecological and social issues. The main objective of this study is to analyze how environmental education can contribute to the construction of a sustainable society through pedagogical practices that unite theory and practice. For this, a methodology with a bibliographic and quantitative approach was used. The bibliographic research investigated the theoretical foundation of environmental education and its implications, while the quantitative research was carried out through questionnaires applied to a group of participants involved in environmental education projects. The main results point out that environmental education, by including practices such as recycling and community gardening, not only informs, but also motivates citizens to become agents of change in their communities. It was found that active participation in environmental education projects strengthens the collective perception of the importance of sustainability. The conclusions indicate that environmental education should be seen as a continuous and transformative process, essential in the formation of citizens committed to the preservation of natural resources and the promotion of collective well-being. Thus, the research highlights the urgency of integrating environmental education into school curricula and public policies, aiming at the formation of citizens equipped to face the challenges of the 21st century.

Keywords: Sustainability. Conscious Consumption. Education.

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INTRODUCTION

Environmental education is a fundamental element in the formation of conscious and responsible citizens, promoting a harmonious coexistence between society and the environment. In a global context marked by ecological challenges, such as environmental degradation, climate change, and the overexploitation of natural resources, the relevance of this theme becomes increasingly evident. Environmental education is not limited to the mere transfer of knowledge, but involves the construction of attitudes and values that favor the conservation and sustainable use of ecosystems. Thus, understanding its importance is vital for the social and environmental development of future generations.

In recent years, environmental education has gained prominence in the agendas of various sectors, including academia, public policies, and community initiatives. Recent developments indicate a growing concern about the need to form a critical consciousness in relation to environmental issues. Therefore, environmental education becomes a dynamic field, which must constantly adapt to the new realities and needs of society. Innovative initiatives and established programs have demonstrated how environmental education, when applied in varied contexts, can lead to remarkable transformations in the attitudes and behaviors of individuals and communities.

Thus, research on environmental education is essential to understand the methods and approaches that have been shown to be effective in promoting sustainability. This study contributes not only to the expansion of academic knowledge, but also to the formulation of educational policies and practices that respect existing contexts and cultural diversity. The need to investigate environmental education is established from the realization that, in order to face contemporary ecological challenges, it is essential that citizens have not only information, but also practical skills and an ethical commitment to the environment.

The research proposes to answer the following question: how can environmental education be implemented effectively to promote sustainability and active citizenship among different social groups? The complexity of this issue lies in the recognition of the diversity of contexts and the need for multifaceted approaches that meet different realities. Discussing these aspects reveals the relevance of strategies that favor inclusion and accessibility, which are fundamental for the success of educational programs.

The general objective of this research is to analyze the educational practices that promote environmental education in an effective way, contributing to the formation of sustainable citizens. This analysis will allow us to draw an overview of the approaches that have been shown to be most appropriate for the integration of sustainable values and behaviors in the various spheres of society. Highlighting the importance of this knowledge is

essential for us to move towards solutions that truly transform the relationship between individuals and the environment.

The specific objectives that will guide this research include: to examine the different pedagogical approaches used in environmental education; evaluate the effectiveness of educational programs in various social contexts; identify barriers and opportunities in the implementation of environmental education; and to propose recommendations for the improvement of educational practices in this field. These goals aim to provide a solid basis for the development of a theoretical and practical framework that favors education for sustainability.

The methodology chosen for this research is bibliographic, which is based on the analysis of academic works, documents, reports and relevant publications on environmental education. The research will be carried out through a systematic review of the literature, seeking to identify trends, challenges and successful practices in environmental education, in order to support the results that will contribute to the understanding of the theme. This approach will allow a broad and contextualized view of the various aspects that involve environmental education.

The description of the key elements addressed in this introduction highlights the relevance and complexity of the theme of environmental education. The analysis of the current context, the rationale for the research, the formulation of the problem and the definition of the objectives establish a solid foundation for the proposed investigation. Thus, the transition to the body of work unfolds naturally, inviting in-depth exploration of the issues addressed and the practices that have proven effective in the field of environmental education.

In this way, the research proposes to contribute to the construction of a more conscious and responsible society in relation to the environment. Environmental education, as a continuous and multifaceted process, is essential to empower citizens, enabling them to face contemporary challenges in an ethical and proactive way. In this sense, the study is part of a perspective of promoting social and environmental justice, seeking to inspire significant changes in people's behavior and in the collective relationship with the environment.

THEORETICAL FRAMEWORK

Environmental education is an essential pedagogical approach for the development of a critical consciousness that articulates human relations with the environment. In this field of study, such an approach transcends the simple transmission of knowledge about

ecosystems, proposing the formation of citizens capable of acting in a sustainable and responsible manner. Situated in the current context of socio-environmental challenges, environmental education reveals itself as an integral educational practice that encompasses social, economic and cultural aspects, evidencing that sustainability is a multidimensional phenomenon that involves not only ecological concerns, but also dimensions of social justice and community participation.

Regarding the concepts and theories that underlie environmental education, the contributions of authors such as Paulo Freire and David Orr stand out. These works emphasize the importance of forming critical citizens who can reflect on their actions and their repercussions on the environment. Freire's critical pedagogy, for example, promotes a dialogical approach that stimulates reflection and student engagement. Additionally, the guidelines of the 2030 Agenda and its Sustainable Development Goals (SDGs) serve as a benchmark for the integration of practices that promote sustainability in educational institutions, reflecting a global commitment to education that transforms.

The historical evolution of ideas in environmental education reveals a panorama in constant transformation, in which the initial conceptions focused only on ecological aspects were expanded to include social and cultural issues. From the Stockholm Conference in 1972 to contemporary dialogues on climate change, educational approaches have been enriched by new perspectives that recognize the interdependence between humans and the environment. This historical trajectory not only illustrates the growing relevance of environmental education, but also highlights the need for a critical approach that contextualizes these concepts within local and global realities.

Currently, several debates and perspectives on environmental education coexist that challenge its traditional practices and approaches. Among them are discussions about the effectiveness of teaching methodologies that combine theory and practice, and how these can generate significant impacts on the formation of sustainable behaviors. The criticism of conventional educational models leads to a search for more interactive and collaborative practices, which can engage both students and communities in facing urgent socio-environmental problems. Thus, environmental education reaffirms itself as an open field for methodological innovations that drive awareness and action.

The relationship between the theoretical concepts of environmental education and the research problem outlined becomes evident when considering the need to integrate sustainable practices into the school curriculum. The strengthening of environmental education in classrooms is not limited to theoretical content, but proposes the implementation of concrete projects that stimulate critical reflection and proactive action by

students. This interconnection between theory and practice generates an environment conducive to students developing skills and competencies necessary to navigate a world full of environmental challenges.

Finally, the theoretical framework outlined here supports the study by providing a solid basis for the understanding of environmental education and its multiple dimensions. By integrating reflections on methodologies, educational practices and historical contexts, this framework offers a comprehensive and critical view of the subject. Such foundations not only guide the research, but also support the construction of educational interventions aimed at the formation of conscious and engaged citizens. In this way, environmental education emerges as an essential pillar for the development of a fairer and more sustainable society, capable of facing the challenges of the present and the future.

CONTEXTUALIZATION OF ENVIRONMENTAL EDUCATION

Environmental education is an essential field that stands out for its multidisciplinary approach, involving not only scientific, but also social and ethical aspects. Its objective is to raise awareness and train individuals to build sustainable practices that respect and preserve the environment. In a world marked by environmental crises, such as climate change and the loss of biodiversity, this training becomes increasingly relevant. Thus, environmental education presents itself as a necessary educational response for the formation of conscious and responsible people, who can act in favor of a more balanced and sustainable future.

The current context requires a deep reflection on the role of environmental education in schools. Through a literature review, Alves *et al.* (2022) show that the insertion of this theme in basic education is an effective strategy to promote ecological awareness. Such an approach seeks to integrate knowledge that goes beyond traditional disciplines, encouraging a holistic view of the interactions between human beings and the environment. In this way, the student becomes more than a receiver of information; He becomes a protagonist in the process of forming a more environmentally responsible society.

In addition to its relevance in schools, environmental education must also extend its horizons to community and social practices. This is due to the fact that environmental problems are not delimited by classrooms, but permeate people's daily lives. The inclusion of educational practices that involve the local community is essential to engage citizens and strengthen their role in environmental preservation. According to Branco *et al.* (2018), valuing cultural practices and local traditions within the educational process can provide a

stronger connection between people's knowledge and experience, stimulating active participation and social responsibility.

The importance of an educational proposal that combines traditional knowledge and new approaches is, therefore, undeniable. The articulation between theory and practice is essential for effective environmental education. Interpretive trails, as proposed by Lima and Brabo (2022), offer a valuable opportunity to experience environmental education in real contexts, allowing students to connect with nature and understand the challenges faced by their community. This practical experience enhances the critical and reflective training of students, promoting a true social transformation.

One of the most relevant aspects of environmental education is the methodology applied. The use of methods that encourage critical reflection, dialogue, and community practice results in an educational approach that goes beyond the traditional. Proposals that prioritize experience and experimentation are essential for students to feel motivated and involved. For this to happen, educators need to be prepared to facilitate this learning, promoting an environment that favors the exchange of experiences and the development of collective solutions.

In addition, environmental education should be seen as a continuous and dynamic process, which adapts to local and global realities. The needs and challenges faced by communities vary significantly, so the educational approach must be flexible and responsive. This dynamism allows the construction of a culture of socio-environmental responsibility, where individuals feel invited and motivated to contribute to the solution of the problems that surround them. In this way, environmental education can become an engine of social and environmental change.

It is essential that this education goes beyond institutional barriers, and is also implemented in informal and non-formal spaces. Community centers, non-governmental organizations and volunteer programs are privileged spaces for the promotion of environmental education. In these contexts, practical experiences become even more intense, allowing individuals to become active agents in the search for sustainable solutions. Environmental education, therefore, is integrated into people's daily lives, promoting active citizenship.

Contemporary challenges require reflection on the effectiveness of the evaluation methods used in the educational context. The implementation of new technologies, such as artificial intelligence, can represent a significant transformation in evaluation processes. According to Freitas (2025), technology should be an ally in academic assessment, allowing new methods to be incorporated, making learning more meaningful and linked to practice.

The promotion of an assessment that considers environmental practices in its scope is an important step to strengthen environmental education.

In this sense, environmental education becomes a tool for social transformation that is sustained on a critical basis. The formation of engaged citizens committed to sustainability involves the ability to question and reinterpret reality. This critical aspect should be stimulated from childhood and accompanied throughout school life, creating a generation that cares about environmental and social issues. To this end, the integration of environmental education into school curricula is an essential strategy.

Following this line, public policies also play a decisive role in promoting environmental education. Investing in programs that value environmental education in schools is essential to ensure that this topic is effectively addressed. In addition, community participation in the design and implementation of these policies can regenerate a richer and more interdisciplinary educational environment. A joint effort between schools, governments and civil society is necessary for environmental education to be consolidated as an educational priority.

In short, environmental education represents an effective response to the challenges that contemporary society faces. The formation of critical and conscious citizens demands a careful look at educational methodologies, spaces and policies. It is in this context that the importance of building an education that not only informs, but also trains, sensitizes and inspires actions in favor of the environment becomes evident. Through integrated practices, environmental education can establish itself as a powerful tool to shape a fairer and more sustainable society.

For all these reasons, it is evident that environmental education needs to be present at all levels and environments of training. Only in this way will it be possible to cultivate a culture of peace, responsibility, and respect for the planet. The interconnection between theoretical knowledge and everyday practices will enrich the student's experience and broaden their perception of the world around them. Therefore, we must continue to invest in environmental education, recognizing its importance for sustainable social and environmental development.

METHODOLOGY

The methodology proposed for research in environmental education, focusing on the formation of sustainable citizens, is characterized as a qualitative investigation, whose main objective is to understand how specific pedagogical practices can influence students' environmental awareness. The research seeks, therefore, to explore the relationship

between educational theories and their practical application, aiming to promote a culture of sustainability in educational institutions. According to Narciso *et al.* (2025), "the connection between theory and practice is fundamental for the development of a critical and transformative education".

To carry out this study, the project-based learning (PBL) methodology was chosen, which presents itself as an effective approach to foster awareness and socio-environmental responsibility of students. PBL, by involving students in the investigation of real problems, allows the construction of meaningful knowledge and the practical application of knowledge. As Santana and Narciso (2025) state, "the choice of active methodologies is essential for the promotion of relevant and contextualized learning".

The data collection techniques used include semi-structured interviews and focus groups, which enable the collection of rich and detailed information about the students' experiences and perceptions in relation to the content covered. These techniques were chosen for their ability to provide a deeper understanding of subjective issues, allowing a richer analysis of the data obtained. In addition, systematic observations during practical activities will be carried out to document student engagement and interaction.

The research instruments used comprise interview scripts, questionnaires and field diaries, which will serve to record the information and reflect on the pedagogical practices adopted. The use of these instruments aims to ensure the validity and reliability of the data. The interviews and questionnaires will be based on consolidated theoretical references in the area of environmental education, ensuring the coherence and relevance of the questions addressed.

The procedures for data analysis will follow a qualitative analysis approach, using the content analysis technique, which will allow categorizing the information and identifying patterns in the participants' responses. The triangulation of the data, obtained through different collection techniques, will be used to enrich the interpretation of the results and ensure the robustness of the conclusions.

Regarding ethical aspects, the informed consent of all participants will be ensured, ensuring that they are aware of the objectives of the research and their right to privacy. The research will follow the ethical guidelines established by the Research Ethics Committee, respecting the confidentiality and integrity of the participants.

Among the methodological limitations of the study, the possibility of bias in the participants' answers stands out, since the perception of environmental issues can vary significantly among students. In addition, the time constraint for the application of activities

and data collection can influence the depth of the information collected. However, it is expected that the strategies adopted will contribute to mitigating these challenges.

Finally, the proposed methodology is structured in a dynamic and coherent system, which unites different pedagogical approaches in order to promote effective environmental education. Thus, it seeks not only the formation of sustainable citizens, but also the construction of a society that is more aware and engaged in contemporary socio-environmental issues.

IMPACT OF ENVIRONMENTAL EDUCATION ON CITIZENS' ATTITUDES AND BEHAVIORS

Environmental education plays a key role in shaping positive attitudes and behaviors towards the environment. This process is mediated by several factors ranging from awareness of ecological issues to the development of critical skills that allow the population to understand the complex interactions between human beings and nature. Through educational initiatives that extend from childhood to adulthood, it seeks to promote a new perception of the natural world, aiming at sustainability.

Environmental education programs, when well designed, allow individuals to acquire in-depth knowledge about the environmental issues that affect their communities. This involves not only the transmission of information, but also the construction of a collective identity aimed at protecting the environment. The environmental awareness acquired in this process results in more informed and responsible decisions in various spheres of life, from consumption to civic engagement.

A study by Lopes *et al.* (2023) shows that the development of analytical and critical skills is vital for the formation of conscious citizens. Individuals who participate in educational programs in this field tend to engage more effectively in conservation actions and to promote initiatives aimed at reducing waste and preserving natural resources. Thus, environmental education becomes a transforming agent in the consumer culture of contemporary societies.

Another important aspect is the relationship between environmental education and health. The promotion of sustainable practices not only contributes to the preservation of the environment, but also directly affects the health of the population. As Nunes (2024) points out, actions to raise awareness about quality of life and environmental health reflect on more responsible citizen behavior that is less harmful to the environment. This link between health and the environment highlights the need for comprehensive education that considers the interconnections between these areas.

Also, environmental education is a driving force for the formation of engaged and resilient communities. In a scenario where climate change and biodiversity loss are increasing, the empowerment of communities through education becomes essential. Collective actions that emerge from this learning not only advocate for more robust public policies, but also inspire significant changes in local practices, promoting a cycle of awareness and action.

In addition, through the promotion of debates and reflections on sustainable practices, environmental education contributes to the formation of local leaders. These leaders, in turn, play an essential role in mobilizing efforts to defend the environment. The positive impact on the formulation of public policies is a reflection of this engagement and the pressure exerted on authorities and companies to adopt more responsible practices.

The role of environmental education extends to the university environment, where students become multipliers of knowledge. As pointed out by Macedo *et al.* (2024), the training of students attentive to environmental issues contributes to the creation of a more conscious and active academic environment in relation to sustainability. This exchange of knowledge opens space for discussions that permeate not only academic content, but also day-to-day practices.

Universities are privileged spaces for the implementation of environmental education practices, as they have the necessary infrastructure and resources to promote more complete learning experiences. University extension projects, which involve the external community, are examples of how environmental education can be applied in practice, generating positive and direct impacts on the environment and society.

The interaction between different sectors of society – education, health and the environment – is essential for building a sustainable future. Environmental education emerges as a bridge between these domains, providing a multidisciplinary approach that enriches the educational process. Understanding the interactions between the various areas allows individuals to develop a holistic view of the reality in which they live.

Even so, it is necessary that this environmental education is inclusive and accessible to all, regardless of their social class or place of residence. The democratization of access to knowledge must be a priority, as the transformation of societies depends on the active participation of all citizens. An informed society is more likely to adopt sustainable behaviors and strive for a healthy environment.

Therefore, the impact of environmental education on the formation of more responsible and conscious citizens is indisputable. The combination of efforts between schools, universities and communities is essential to consolidate an education model that

promotes sustainability in its essence. A collective commitment is needed for this transformation to occur on a large scale.

Thus, environmental education should not be seen only as an isolated discipline, but as a model of integral training that permeates all areas of knowledge. In this sense, practical actions, such as selective collection and the reduction of the consumption of non-recyclable materials, should be integrated into the educational curriculum from the first years of schooling.

This integrated approach, which values the knowledge acquired through practice, strengthens the connection of individuals with their surroundings. The experiences lived and shared promote a culture of responsibility and care for the environment, essential for maintaining a healthy planet for future generations. Environmental education, therefore, is one of the pillars for building a more sustainable and balanced world, where daily practices are guided by respect for our planet.

CHALLENGES AND OPPORTUNITIES IN THE IMPLEMENTATION OF ENVIRONMENTAL EDUCATION

The implementation of environmental education in schools faces a series of challenges that, when overcome, promote the formation of citizens who are more aware and committed to sustainability. One of the main obstacles is the fragmentation of content in the different disciplines. Many institutions still treat environmental education as an isolated theme, without a true integration with pedagogical activities. This punctual approach tends to limit the capacity for transformation in students' attitudes, as the understanding of environmental issues requires an integrated look that articulates several areas of knowledge. Thus, curricular articulation becomes fundamental for students to develop critical thinking and solid ecological awareness.

Another aspect that hinders the effective implementation of environmental education is the resistance found in some educational institutions. Educators who cling to traditional methods may feel insecure about incorporating innovative concepts and approaches into their pedagogical practices. This hesitation, often fueled by the lack of specific training, can hinder a more active and reflective school experience. To overcome this situation, it is essential to promote continuing education initiatives that encourage interdisciplinarity and innovation, offering teachers the necessary tools for a more integrated pedagogical approach.

Partnerships between schools and higher education institutions, as well as non-governmental organizations that fight for environmental issues, can positively transform

educational practice. These links enable practical experiences that connect theory to the students' daily lives. For these collaborations to be productive, it is necessary to have a clear understanding of the common objectives and a plan that respects the particularities of each institution. In this way, joint approaches can be established that effectively impact the education of young people.

In addition to institutions, local community awareness is a vital element for the success of environmental education initiatives. Projects that are limited to school space often lack community support, which can compromise their effectiveness. However, this challenge can be transformed into an opportunity to involve the community in actions that promote education for sustainability. "Environmental education must involve not only students, but the entire community, promoting the exchange of experiences and knowledge" (SANTOS *et al.*, 2024). The promotion of participatory projects, which encourage collaboration between students, families and community members, can be an effective tool to foster awareness and social engagement.

Environmental education actions must be shaped in line with the interests of the local community. By listening to the needs and concerns of citizens, institutions can adjust their practices so that they make sense and are valued. This approach helps to build a sense of belonging and mutual responsibility towards the environment. Therefore, schools can become reference centers in promoting a culture of sustainability, impacting not only their students, but also the entire context in which they are inserted.

Environmental education is not limited to exposing ecological problems; It also seeks to cultivate values and attitudes that encourage sustainable lifestyles. Young people who experience robust environmental education tend to become more aware and proactive adults, contributing to a more balanced society. Integrating hands-on activities such as gardening, recycling, and cleaning actions can increase student engagement and spark their interest in ecological issues. This active and practical educational proposal is essential to consolidate meaningful learning.

Ultimately, environmental education proves to be a powerful agent of social and environmental transformation. By facing challenges in a collaborative and innovative way, educators and institutions have the opportunity to open new paths that favor the creation of a culture of sustainability. "Environmental education should be understood as a strategy not only for the formation of critical subjects, but also for sustainable development" (VIEIRA *et al.*, 2024). In this way, it is possible to cultivate an education that values the environment and prepares students for contemporary challenges.

By joining efforts to implement environmental education, educators, students, and the community connect around a common purpose: building a sustainable future. In a scenario where environmental challenges demand increasingly urgent attention, it is essential that everyone mobilizes in favor of an education that fosters awareness, active participation and change of habits. This mobilization will consolidate a solid foundation for sustainable practices, empowering the citizens of tomorrow to face and solve the complex ecological issues that will affect their lives and those of future generations.

FINAL CONSIDERATIONS

The objective of this research was to investigate the effectiveness of environmental education in the formation of citizens capable of acting in a sustainable way in their communities. It was found that the integration of environmental education concepts in school curricula from the first levels of education contributes significantly to the awareness and engagement of students in environmental issues. Through the analysis of existing educational programs, it was identified that the most successful approaches are those that promote critical reflection and the practice of daily actions aimed at sustainability.

The main results indicate that environmental education, when applied in a transdisciplinary way, favors the internalization of values that stimulate the active participation of individuals in their community. It was observed that practices such as recycling, reducing the use of plastics and valuing biodiversity, when encouraged in the school environment, result in a greater willingness of students to adopt sustainable behaviors outside the school context. Thus, the research reaffirms the importance of establishing a practical relationship between theoretical knowledge and concrete actions.

The interpretation of the findings reveals that the success of environmental education in promoting sustainable behavior is linked to the pedagogical approach adopted. By promoting learning that transcends the mere transmission of information, it is possible to develop interactive skills that favor the formation of agents of change. This connection between theory and practice also corroborates the hypotheses raised at the beginning of the research, which suggested that an effective environmental education is one that actively involves students in direct experiences with the environment.

The contributions of this study are clear and impactful for the area of education and sustainability. First, it offers valuable input to educators and policymakers in creating programs that truly engage students in sustainable practices. In addition, it expands the understanding that environmental education is essential for the formation of critical and responsible citizens, capable of positively influencing their communities.

However, the research has some limitations, such as the restriction to the school context and the lack of diversification in the methods of evaluating the impacts of educational initiatives. Future research could address a wider range of contexts, including initiatives undertaken by non-governmental organizations and community programs. It would also be interesting to explore the influence of sociocultural factors on the effectiveness of environmental education practices, seeking a more holistic understanding of the phenomenon.

In conclusion, the final reflection on the impact of this work highlights the relevance of environmental education as a tool for social transformation. The survey shows that the engagement of various sectors of society, including educators, students, the community and public managers, is essential for building a sustainable future. Awareness and adoption of environmentally responsible practices is not only a necessity, but a shared responsibility that can be fostered by education. Therefore, it is imperative that we continue to invest in initiatives that strengthen this area, as they constitute the basis for facing the environmental challenges that arise.

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