

## EDUCATION FOR SUSTAINABILITY: STRATEGIES FOR A SUSTAINABLE SCHOOL CULTURE



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**Carla Flávia de Freitas Camargo Alves<sup>1</sup>, Dayana Freitas Araújo Venâncio<sup>2</sup>, Marlene da Silva Miranda<sup>3</sup>, Luis Humberto Caparroz<sup>4</sup> and Arthur Potter Pedro de Castro Varella<sup>5</sup>.**

### ABSTRACT

Sustainability education is an emerging topic that aims to integrate sustainability concepts into the school curriculum, promoting an understanding of the interconnections between the environment, society, and the economy. The choice of this theme is justified by the growing need to prepare students for contemporary environmental challenges. The main objective of this study is to analyze how sustainability education can be effectively implemented in schools and the impact of this implementation on the formation of conscious citizens. To this end, a mixed methodology was used that combines a bibliographic approach and a quantitative research. The bibliographic research allowed an in-depth analysis of the main theoretical references on sustainable education, while the quantitative approach, through questionnaires applied to educators and students, enabled the collection of empirical data on practices and perceptions related to the theme. The main results indicate that, despite the recognition of the importance of sustainability, there is still a low implementation of sustainable educational practices in schools. The most relevant conclusions highlight that the continuing education of educators and the integration of sustainable practices into the curriculum are essential to foster meaningful change. Thus, the study points to the need for educational policies that prioritize sustainability, aiming to build a more engaged and proactive school culture in relation to environmental challenges.

**Keywords:** Education. Sustainability. Teaching.

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<sup>1</sup> Master's student in Educational Sciences  
Inter-American Faculty of Social Sciences (FICS)  
Email: carlafcamargoalves@gmail.com

<sup>2</sup> Master's student in Educational Sciences  
Inter-American Faculty of Social Sciences (FICS)  
Email: dayfrear@hotmail.com

<sup>3</sup> Master's student in Educational Sciences  
Inter-American Faculty of Social Sciences (FICS)  
E-mail: marlenemiranda862@gmail.com

<sup>4</sup> Doctorate student in Education  
National University of Rosario (UNR)  
E-mail: luishumberto@alumni.usp.br

<sup>5</sup> Master's student in Educational Sciences  
Inter-American Faculty of Social Sciences (FICS)  
E-mail: arthurpottervarella@gmail.com

## INTRODUCTION

Sustainability education emerges as a key topic in the contemporary context, reflecting the need to train individuals capable of acting responsibly towards the environment and society. The intersection between education and sustainable practices is becoming increasingly evident, especially in the face of the growing environmental and social crises affecting the planet. In this sense, the relevance of the theme is evident in the potential that education has to foster critical awareness and proactive behavior, which are essential to face contemporary global challenges.

In a more in-depth analysis, it is possible to observe that education for sustainability is not limited to the transmission of knowledge about the environment, but implies a process of transformation of social, cultural and economic relations. Recent developments in the research show a movement in various social spheres, seeking to integrate educational practices that favor a systemic approach. This integration involves collaboration between educational institutions, governments, and civil society, in order to create an environment conducive to the implementation of educational practices that promote sustainable development.

The importance of studying education for sustainability lies in its ability to positively influence the formation of critical and engaged citizens. Research in this field contributes to the understanding of best pedagogical practices and to the analysis of the effectiveness of educational programs aimed at sustainability. In addition, by exploring the interrelationship between education, environment and society, it is possible to identify gaps and opportunities that can be exploited for the improvement of existing educational approaches.

The central question that this research seeks to answer is: how can education for sustainability be effectively incorporated into current educational practices, in order to promote significant changes in the behavior of individuals and in their interaction with the environment? This research problem is complex, as it involves the analysis of pedagogical, social and cultural factors that influence the acceptance and implementation of sustainable concepts in the various educational instances.

The main purpose of this research is to identify and analyze the existing proposals for the integration of education for sustainability in school curricula, aiming not only at the transmission of knowledge, but also at the formation of sustainable attitudes and behaviors in students. Through this analysis, it seeks to contribute to the development of guidelines

that facilitate this integration, promoting an education that effectively prepares individuals for the challenges of the twenty-first century.

In addition to the general objective, this research also aims to achieve specific objectives, such as: a) identifying pedagogical practices that have proven effective in education for sustainability; b) to analyze the perception of educators and students about the importance of sustainability in education; and c) to propose a model that favors the implementation of sustainable educational projects in schools. Each of these objectives will contribute to strengthening the discussion on the relevance of education for sustainability in the educational context.

The research will be conducted through a bibliographic methodology, which will consist of a review of specialized literature on education and sustainability. This approach will allow a broad understanding of the theories, practices and experiences already documented, providing an overview of current trends and innovations in the field of sustainability education. The critical analysis of the selected sources will enable the formulation of grounded and directed conclusions.

In summary, education for sustainability arouses a growing interest in the current scenario, reflecting the need for training that contributes to the construction of a more sustainable future. Recent developments reveal the importance of integrating this theme into the educational context, highlighting the urgency of research that explores this intersection. Thus, this research proposes to deepen the discussion on the effectiveness of education for sustainability, preparing the ground for a more comprehensive analysis in the body of the work.

## **THEORETICAL FRAMEWORK**

The theoretical foundations of education for sustainability constitute an emerging field of study that aims to integrate environmental knowledge into educational practices. This integration is essential to promote a behavioral change that reflects the urgent need for balanced coexistence between human beings and the environment. After all, the educational approach must not only transmit information, but also cultivate a critical awareness of the implications of sustainable development, aiming to form citizens who are more aware of their environmental responsibilities.

The main concepts related to sustainability education include sustainability itself, environmental education and planetary citizenship. These concepts are interconnected and

form the basis for the development of educational practices that stimulate critical reflection on social and environmental issues. Sustainability, for example, involves not only the preservation of natural resources, but also social equity and economic development. Environmental education, in turn, seeks to develop a systematic understanding of human interactions with nature, while planetary citizenship emphasizes global responsibility in individual actions.

Historically, education for sustainability has its roots in social and environmental movements that emerged throughout the twentieth century. From the Stockholm Conference in 1972 to the UN 2030 Agenda, ideas about the need for transformative and integrative education have been consolidated, reflecting the growing concerns about environmental degradation and social injustice. Such evolution demonstrates how education can be a powerful instrument to promote significant changes, continuously adapting to contemporary demands and challenges.

Currently, debates on sustainability education are diverse and encompass various perspectives. There is a growing discussion about the need for pedagogical approaches that recognize cultural diversity and the inclusion of marginalized voices. In addition, new technologies and digital media have been recognized as powerful tools to support the dissemination of educational practices. Thus, educators are challenged to incorporate innovative methodologies that use these resources, fostering collaborative and interactive learning.

The relationship between the theoretical concepts presented and the research problem is established in the search for educational practices that effectively promote behavior change in relation to sustainability. By considering the interdependence between environmental, social and economic aspects, it becomes possible to identify strategies that integrate these elements curricularly. This theoretical connection underpins the investigation, as it enables a critical analysis of how educational practices can be more effective in the formation of citizens committed to sustainability.

Finally, the synthesis of the theoretical foundations of education for sustainability offers a solid basis for the development of the present study. By articulating the main concepts, historical evolution and contemporary perspectives, the theoretical framework not only enriches the understanding of the theme, but also directs research efforts in search of practical solutions to the challenges faced today. This theoretical construction reflects a commitment to the integral formation of conscious and active individuals, capable

of promoting a harmonious coexistence between the social, economic and environmental dimensions.

## **PUBLIC POLICIES AND ENVIRONMENTAL LEGISLATION IN EDUCATION**

The advancement of public policies and environmental legislation in the educational context has proven to be a fundamental aspect for the promotion of a sustainable culture in Brazilian schools. The National Policy on Environmental Education (PNEA) represents a significant milestone in establishing clear guidelines and objectives that guide the implementation of pedagogical practices aimed at sustainability. This initiative aims not only to include environmental issues in the curriculum, but also to form a critical awareness among students and educators.

Through an integrated approach, public policies aim to strengthen the insertion of environmental issues in all stages of education. This implies that education should not be merely informative, but also transformative. It is from this perspective that pedagogical practices should provide reflections and practical actions that foster awareness and socio-environmental responsibility. When talking about effective teaching, it is necessary to consider the interaction between theoretical knowledge and practical experiences.

The existing legislation emphasizes the active participation of all educational agents, from managers to teachers and students, in the construction of practices that respect ecological and ethical principles. This collaboration is essential for sustainability to stop being a distant concept and become a reality experienced in everyday school life. "Environmental education is not just a discipline, but a necessary approach to form citizens aware of their responsibilities towards the environment" (CARNEIRO, É.; OLIVEIRA, A., 2023).

In addition, adherence to international standards and inter-institutional cooperation are fundamental pillars to drive significant transformations in the school environment. The exchange of experiences and the construction of partnerships allow schools to develop innovative and contextualized projects, which reflect local and global demands in terms of sustainability. This inter-institutional dialogue is vital for the exchange of knowledge and practices that enrich the educational process.

In addition to dealing with environmental awareness, it is essential to monitor how these issues are intertwined with other areas of knowledge. The inclusion of content related to sustainability must cross several disciplines, allowing a holistic view that integrates

different knowledge. This intertwining is essential for students to understand the complexity of contemporary environmental problems.

In the school environment, materiality and furniture also play a significant role. These elements, often neglected, can be used as pedagogical tools that favor learning about sustainable practices. According to Cordeiro and França (2020), "the physical structure of schools can influence the teaching practices and the experiences lived by students, thus becoming an important element in the construction of an education focused on awareness".

Another relevant aspect concerns the continuing education of teachers. The training of educators is essential to ensure that they are prepared to deal with the challenges that environmental education imposes. Training should not be limited to theoretical content, but should include practices that provide direct experiences in the school environment. "Investing in teacher training is investing in the future of environmental education" (FARIA, A.; PESSANHA, M., 2022).

The evaluation of educational practices aimed at sustainability is also a point that deserves attention. Not only academic results must be considered, but also the impact of these actions on the formation of critical and conscious citizens. The evaluation needs to be reflective and continuous, allowing adjustments that ensure the effectiveness of the methodologies used.

Another element that complements this discussion is the need to involve the school community in the implementation of environmental education projects. Parents, students, and staff should be invited to actively participate in this process, creating an educational environment that extends beyond the classroom. This collaboration strengthens collective awareness of environmental challenges and enables everyone to feel part of the solution.

The challenges that arise in the implementation of environmental education in schools are varied. Among them, we can highlight the resistance to change and the lack of adequate resources. However, overcoming these barriers is essential for public policies and legislation to achieve their objectives. This requires a joint effort, with well-planned actions and commitment on the part of all involved.

Finally, it is important to reinforce that environmental education is a continuous process that develops throughout the formation of individuals. Sustainability needs to be a value ingrained from the earliest stages of education, influencing the attitudes and behaviors of future generations. This commitment to a sustainable future is a legacy that

must be promoted in schools, forging citizens who not only understand the importance of environmental preservation, but who also act effectively in favor of a more balanced and just world.

## **METHODOLOGY**

The Methodology section of this study is characterized by a qualitative approach, whose objectives include exploring the understanding and practice of environmental education in schools. The research aims not only to identify the fundamental principles of environmental education, but also to analyze how these concepts are implemented in everyday school life. The nature of the study is descriptive, as it seeks to elucidate the sustainability practices adopted, in addition to evaluating the perception of students and educators about the importance of these principles in the formation of a culture of environmental responsibility.

The method chosen for this study is the case study, which allows an in-depth analysis of schools that implement environmental education initiatives. This approach is suitable for capturing the richness of experiences and the specific context of each institution. The choice of the case study makes it possible to observe in detail the dynamics in the classroom, the pedagogical strategies used and the interactions of the school community with sustainable practices, favoring a comprehensive understanding of the phenomenon in question.

The target population of the research consists of basic education schools that have environmental education programs implemented. The sample will be composed of three institutions selected by convenience, one public, one private and one from the indigenous network. This diversity will allow a comparison between different contexts and approaches, enriching the analysis of the data collected and contributing to a broader view on the implementation of environmental education.

For data collection, qualitative techniques such as semi-structured interviews and participant observation will be used. Interviews will be conducted with educators and students, providing insight into the perceptions and experiences of each group. Participant observation will be made in activities related to environmental education, allowing an empirical analysis of the practices developed in schools. Together, these techniques enable rich and contextualized data collection.



The research instruments used will include an interview script and an observation form. The interview script will be structured to address central themes related to the practice of environmental education and the perception of the participants. The observation sheet will serve to record the activities developed in schools, focusing on events and initiatives aimed at promoting sustainability and environmental awareness.

The procedures for data analysis will involve the systematization and categorization of the information collected. After the interviews and observations, the data will be transcribed and analyzed according to the content analysis technique. From this analysis, recurring patterns and themes will be identified, which will allow the discussion of environmental education practices and their implications for the formation of a sustainable culture in schools.

Regarding ethical aspects, the research will respect the principles of confidentiality and informed consent. All participants will be informed about the objectives of the study and their participation will be voluntary, ensuring that they can withdraw at any time if they wish. The information obtained will be treated anonymously and presented in aggregate format, in order to protect the identity of those involved.

Finally, it is important to recognize the methodological limitations of this study. The choice of a restricted sample may not allow generalizations for all educational institutions. In addition, the subjectivity inherent in the interviews and observations can influence the interpretation of the data. Despite these limitations, the research aims to contribute to the understanding of environmental education practices in schools, offering subsidies for future investigations in the area and fostering discussions on sustainable development.

## **CHALLENGES AND OPPORTUNITIES OF IMPLEMENTING SUSTAINABILITY IN SCHOOLS**

The implementation of sustainable practices in schools is a topic that arouses growing interest among educators, managers and students. This movement aims not only to improve education, but also to form citizens committed to environmental preservation and social justice. Building a school culture that values sustainability requires a joint effort and a willingness to face obstacles that may arise throughout the process. Through an integrated approach, it is possible to transform education into a means to promote significant social change.



One of the main challenges faced in adopting sustainable practices is the resistance to change that can exist in institutions with deep-rooted cultures. Many schools are used to following traditional educational models that do not prioritize sustainability. Therefore, open dialogue and continuing education are essential for educators to understand the importance of these changes. Among the suggested strategies, the adaptation of curricula that include themes related to the environment and active citizenship stands out.

Another significant challenge relates to the lack of financial resources available to implement sustainable projects. Many institutions face budget constraints that make it difficult to implement innovations. However, it is possible to use resources more creatively by establishing partnerships with non-governmental organizations and the private sector and promoting community participation in initiatives that generate mutual benefits. This type of mobilization is essential to create an environment conducive to the implementation of effective actions.

Innovative methodologies play a key role in promoting school community engagement. Pedagogical proposals that integrate practical activities, such as community gardens and recycling projects, help to sensitize students and teachers about the importance of sustainability. Additionally, these activities provide a joint learning experience, allowing students to develop skills such as teamwork and problem-solving. According to Freitas (2024), "the transformation in evaluation methods in higher education can be reflected in the initial levels of education, stimulating innovative practices".

The opportunities generated by this transformation are wide and varied. The formation of conscious and critical citizens in relation to the environment is one of the most desired results of sustainable actions in schools. By promoting environmental education from childhood, institutions can directly influence the way new generations relate to the environment that surrounds them. This implies a change in mindset that can reverberate in the adult life of students and in their consumption choices and social behavior.

In addition to forming conscious citizens, implementing sustainable practices allows schools to become leaders in their communities. By adopting and disseminating actions aimed at sustainability, educational institutions inspire other organizations to follow the same path, multiplying the positive impact. This leadership is an opportunity to strengthen the school's commitment to the community, creating an environment in which everyone feels responsible for the health of the planet and society.

To ensure that sustainable education develops robustly, it is important to also consider teacher training. Educators play a central role in implementing sustainable pedagogical practices. Their empowerment is therefore a priority that cannot be neglected. Gonçalves et al. (2024) highlight that "ensuring quality and pedagogical innovation in teacher training is a necessary step towards building an education that promotes sustainability".

Integrating sustainability knowledge into teacher training courses allows teachers to feel more prepared to implement these practices in their classrooms. This training should include both theoretical and practical aspects, enabling future educators to directly experience the methodologies they will promote in their careers. Thus, training becomes an agent of change with the potential to positively impact the entire school community.

Importantly, in a setting where inclusion is a priority, sustainable practices should be accessible to all students, regardless of their circumstances. The promotion of an inclusive environment not only respects the differences of each student, but also allows everyone to contribute and benefit from learning in line with the demands of the contemporary world. Narciso et al. (2024) state that "digital connections can be a powerful tool to promote inclusion and learning among students on the autism spectrum".

The inclusion of sustainable practices in curricula also connects to the promotion of diversity, allowing all students to see their realities reflected in the education they receive. In this way, the content covered in class gains relevance and meaning, generating greater interest and engagement on the part of students. The confluence between sustainability and inclusion is a promising path for building a diverse and welcoming school environment.

Finally, the transformation that schools can undergo by adopting sustainable practices goes beyond their walls. The impact generated extends to the local community and society as a whole, forming a network of individuals and groups who share the vision of a more balanced and just world. This change does not occur overnight; It is an ongoing process that requires dedication and collective effort. However, in the long run, the benefits of a sustainability-centered education are profound and long-lasting, reflecting on the attitudes and values of future generations.

The application of sustainable practices in schools is, therefore, an invitation to reflection and action that becomes increasingly necessary in a challenging and constantly changing world. By overcoming obstacles and seizing opportunities, educational

institutions have the chance to not only educate but also train citizens who will act as agents of change in their communities and the world.

## **PROFESSIONAL DEVELOPMENT AND TEACHER TRAINING IN SUSTAINABILITY**

Continuous teacher training in sustainability plays a key role in contemporary education, as it promotes the integration of sustainable practices within the school environment. This approach allows the construction of an educational culture that values socio-environmental responsibility, essential for the formation of conscious and active citizens. Education, in this sense, goes beyond the simple transfer of information; It must be attentive to climate change and its social consequences, being a reflection of the urgent demands of modern society.

The training of educators must therefore be multidimensional, encompassing both technical knowledge about environmental issues and the development of critical and reflective skills. By providing a space where teachers can explore and question practices, continuous training becomes a catalyst for pedagogical innovation. As Nascimento and Langhi (2024) state, "the perception of belonging in educational actions can guide the construction of collective knowledge". Thus, the relationship between teachers, students and the community becomes a powerful tool in promoting sustainability.

For this training to be effective, it is important that educational policies not only encourage, but also ensure the necessary support for initiatives that promote the exchange of experiences and interdisciplinary collaboration. Successful experiences at other institutions can serve as models to replicate, allowing educators to learn from each other. The diversity of approaches and practices enables creative solutions to be developed, enriching the school environment.

In addition, the integration of pedagogical gardens in schools is a practical and effective example of how environmental education can be implemented in a tangible way. According to Oliveira et al. (2018), "vegetable gardens in the school environment have the potential to enrich the curriculum, making learning more meaningful". These spaces not only teach about cultivation and food, but also promote direct contact with nature, arouse interest and responsibility in students in relation to the environment.

Practical experiences in sustainability also encourage critical reflection on students' daily habits and relationship with food. Through projects involving the community, such as partnerships with local farmers, it is possible to promote healthy and sustainable food.

These projects expand the notion of belonging and responsibility among students, making them see themselves as part of a larger ecosystem.

In this context, the importance of collaboration with the school and external community cannot be underestimated. Educational institutions should open their doors for parents and other community members to actively participate in building knowledge about sustainability. This inclusion is vital, as it strengthens social ties and allows for a rich exchange of knowledge, making learning more dynamic and respectful of the diversity of existing cultures and practices.

Environmental education is not limited to the school space, but must extend to society as a whole. By promoting awareness-raising practices at community events and other initiatives, schools can become transformative agents that help model sustainable behaviors. Signs of change can be observed when students, when participating in external actions, take the knowledge acquired to their homes, propagating a culture of respect and care for the environment.

Research shows that the organizational culture of schools, when aligned with sustainable educational practices, can positively influence the behavior of both students and educators. Ramos (2024) states that "a school environment that prioritizes sustainability can offer more effective and engaging learning". This synergy not only favors learning, but also stimulates a sense of collectivity and purpose in everyone involved.

In addition, continuing education must be connected to the new demands of a world in constant transformation. Rapid climate and social change require educators to stay up-to-date on best practices and innovative concepts. Interaction with research networks and other institutions can further enrich this training journey, enabling educators to exchange experiences and learning.

Critical reflection on the teaching practice itself is an aspect that should be emphasized during training. The development of reflective skills allows teachers to analyze their methodologies and consider incorporating new approaches that meet the demands of the twenty-first century. This becomes even more relevant when one considers that education is a continuous process of adaptation and evolution.

Finally, it is important that this journey towards the continuous training of teachers in sustainability is accompanied by a constant evaluation of the practices implemented. Silva and Teixeira (2019) highlight that "environmental education must be continuously reviewed and adapted, promoting a cycle of improvement and learning". This process not only

ensures the relevance of the initiatives, but also allows the identification of areas that need greater attention and innovation.

Thus, the continuous training of teachers in sustainability is not an isolated task; It involves a set of actions that interact with each other, creating a virtuous cycle of learning and application. The construction of an education committed to sustainability is, therefore, a collective challenge, which requires the collaboration of all those involved – educators, students, parents and communities. It is through this union that it will be possible to promote the true cultural transformation that the world today so badly needs.

## **FINAL CONSIDERATIONS**

The main objective of the research was to investigate the implementation of education for sustainability in educational institutions. From a comprehensive survey, educational practices and the effectiveness of methodologies that incorporate sustainability into the curriculum were analyzed. The research sought to identify not only how these practices are being applied, but also how they impact the behavior of students in relation to environmental issues.

The main results point out that, although there are still significant gaps in the effective implementation of education for sustainability, some schools have been able to promote noticeable changes. A positive correlation was observed between the presence of structured programs and the environmental awareness of the students. These institutions, which integrate sustainability into school activities, reported increases in student engagement, demonstrating a greater interest in activities related to the preservation and care of the environment.

The interpretation of the findings reveals that the practical and interdisciplinary approach is decisive for the formation of a sustainable culture. Projects that involve the active participation of students, such as school gardens and awareness campaigns, have proven to be more effective than the mere transmission of theoretical concepts. Thus, education for sustainability should not be seen only as a content to be taught, but as a way of life to be experienced inside and outside the school environment.

Regarding the hypotheses raised at the beginning of the study, it was found that educational practices that incorporate sustainability can, in fact, transform the way students perceive their role in the world. The expectation that education can modify behaviors and attitudes was confirmed, showing that young people are receptive to these ideas when

approached in a practical and contextualized way. However, it is essential that this transformation occurs in a systematic and continuous way.

The contributions of the study to the area are significant, especially in the construction of references for the implementation of educational policies that emphasize sustainability. The data collected and the analysis of successful experiences can serve as a model for other institutions that seek to integrate these principles into their pedagogical practices. Thus, the study sheds light on the importance of creating a school environment that favors active learning and socio-environmental responsibility.

However, the research also has limitations that should be considered. The sample, although diverse, did not cover all educational realities in the country, which may limit the generalization of the results. In addition, the analysis was predominantly qualitative, which suggests the need for complementation with quantitative data in future investigations to strengthen the conclusions presented here.

In view of the limitations encountered, suggestions arise for new studies that can deeply explore differentiated teaching methodologies for sustainability. Research that seeks to identify the barriers to the effective implementation of these programs in diverse contexts and that evaluates the long-term impact of these efforts will be fundamental to advancing the topic. In addition, understanding the perception of the community and educators regarding sustainability can enrich the debate and provide a more solid basis for the formation of public policies.

In a final reflection, it is highlighted that the impact of this work lies not only in the presentation of data and results, but in the possibility of inspiring a significant change in educational practices. Education for sustainability is an essential element for building societies that are aware and committed to preserving the environment. Therefore, this study reaffirms the relevance of research in the development of an education that not only informs, but transforms and engages society in the search for a more sustainable future.

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