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Connecting Education and Nature: The benefits of direct contact with the natural environment for the holistic development of ninth-grade students at the Municipal School Prof. Dr. Amaro Fernandes de Oliveira Sobrinho

**Iranildo José da Cruz Filho**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Viviane Cristina de Lucena Duarte**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

*Corresponding author*

**Diego Santa Clara Marques**

Universidade Federal de Pernambuco

[diego.scmarques@ufpe.br](mailto:diego.scmarques@ufpe.br)

**Salete Santos de Moraes**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Pierre TeodosioFelix**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Elton Douglas Silva de Aquino**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Suzana Ferreira Da Silva**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Karla Crystina Costa dos Santos**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Érika Lima Da Silva Sousa**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Ana Thamires Nascimento de Macêdo**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Josilea Maria leal**

Municipal School Dr. Amaro Fernandes de Oliveira Sobrinho

**Abstract.** This study examined the benefits of direct contact with nature for ninth-grade students at Escola Municipal Prof. Dr. Amaro Fernandes de Oliveira Sobrinho. It emphasized hands-on experiences, such as visits to farms, the establishment of vegetable gardens, and the revitalization of existing gardens. These activities were designed to enhance academic learning and promote the holistic development of students. Interaction with the environment provided a deeper understanding of ecosystems and sustainable practices, enabling students to directly engage with concepts such as natural cycles and environmental impacts. In addition to the academic advantages, outdoor experiences have been shown to improve students' emotional well-being by reducing stress and fostering a sense of overall wellness. The activities also cultivated social skills, including communication and collaboration, by involving students in group projects. Immersion in nature contributed to a more collaborative and inclusive atmosphere, while sustainability practices

heightened environmental awareness. The findings underscore the importance of integrating natural experiences into the school curriculum to facilitate more meaningful learning and prepare students to become responsible and well-rounded citizens in an increasingly urban and digital world.

**Keywords:** environmental education, environment, student development, experience report

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## Introduction

Students' interaction with nature is a fundamental aspect of the educational process and provides numerous benefits that extend beyond mere academic learning (Leite et al., 2023). In an increasingly urbanized and digital world, fostering outdoor experiences and direct engagement with the natural environment not only enhances students' knowledge but also contributes to their overall development (De Carvalho, 2023).

Activities outside the school environment, such as trips to parks, tourist attractions, school gardens, ecological trails, and projects designed to observe local fauna and flora, are effective means of promoting students' engagement with nature (De Carvalho, 2023; Leite et al., 2023). These experiences provide opportunities for direct observation of ecosystem functions and the dynamics of relationships among living organisms. Immersion in natural environments stimulates cognitive development in various ways. First, nature presents a vast and diverse context for learning (Nakaoshi & Fortunato, 2023).

When students explore a garden or forest, they are encouraged to utilize their observation, analytical, and critical thinking skills. They gain insights into the cycles of nature, biodiversity, and the effects of human activities on the environment. This knowledge is more effectively absorbed through direct experience rather than solely through textbook study (De Carvalho, 2023; Leite et al., 2023).

In addition, nature fosters the development of creativity and problem-solving skills. Outdoor exploration often necessitates that students adapt to unexpected situations and seek solutions to natural challenges. This practice enhances critical thinking and flexibility, which are essential not only for education but also for everyday life (Nakaoshi; Fortunato 2023)..

Contact with nature significantly impacts students' emotional and psychological health. Research indicates that exposure to natural environments reduces stress and anxiety, enhances mood, and fosters a sense of well-being (De Carvalho, 2023; Leite et al., 2023; Nakaoshi, 2023; Fortunato, 2023; Pinheiro & Paixão, 2024). Natural settings are generally more calming and less overwhelming than urban areas, helping students feel more centered and at ease (De Carvalho, 2023). Furthermore, nature can offer a safe space free from social pressures, allowing students to disconnect from the stresses and responsibilities associated with school. This sense of freedom and tranquility can be especially beneficial for those who are experiencing emotional difficulties or managing stress (Pinheiro & Paixão, 2024).

Interaction with nature also promotes social and cooperative development among students. Outdoor activities often involve teamwork, which can enhance communication and collaboration skills (Junior et al., 2024). Gardening projects, for instance, require students to collaborate in planning, planting, and caring for plants, thereby fostering a sense of shared responsibility and community. Furthermore, being in a natural environment can help dismantle social and cultural barriers. In a less structured and more informal setting, interactions among students tend to be more spontaneous and authentic. This can strengthen friendships and cultivate a more cohesive and inclusive school environment (De Carvalho, 2023; Leite et al., 2023; Junior et al., 2024).

Direct contact with nature is a crucial step in fostering environmental awareness. By immersing themselves in the beauty and complexity of ecosystems, students become increasingly cognizant of the significance of environmental preservation. Projects that involve species monitoring, recycling, and resource conservation help instill values of sustainability and ecological responsibility (Cardoso et al., 2023). This awareness is vital for cultivating citizens who are committed to protecting the environment. As global environmental issues, such as climate change and biodiversity loss, continue to escalate, it is imperative that new generations comprehend the impact of their actions and choices on the planet (Schultz & Alves, 2023).

In addition to the cognitive and emotional benefits, interaction with nature significantly contributes to students' physical health. Outdoor activities, such as walking, playing games, and participating in sports, promote physical activity and help combat sedentary lifestyles. Exposure to sunlight is also beneficial, as it aids in the production of vitamin D, which is essential for bone and immune health (Penz et al., 2023). Natural environments often provide opportunities for exercise that are more enjoyable and less monotonous than physical activities conducted indoors. By combining physical exercise with the enjoyment of being outdoors, students may find physical activity more appealing and sustainable (Lopes et al., 2023).

Therefore, students' interactions with nature offer a multitude of benefits that extend beyond traditional academic education. This engagement fosters cognitive and emotional development, enhances social skills, and promotes environmental awareness. Direct contact with the natural environment is a crucial component of a comprehensive education for students (Guimarães, 2010). In an increasingly digital and urbanized

world, it is essential to ensure that students have regular opportunities to connect with nature for their growth and well-being. Integrating nature into the school curriculum is not merely an enhancement of education; it is a necessity for preparing students to confront future challenges in a balanced and sustainable manner (De Carvalho, 2023; Leite et al., 2023; Junior et al., 2024).

This study aimed to qualitatively explore the experiences of ninth-grade students from Elementary School II at Escola Municipal Prof. Dr. Amaro Fernandes de Oliveira Sobrinho. The experience began with a visit to the Meu Refúgio site, where students had the opportunity to connect with nature and learn about sustainable practices. Upon returning to school, they actively participated in the construction of a vegetable garden and the revitalization of an existing garden within the school environment. These hands-on activities enhanced and deepened their understanding of environmental issues and sustainability.

### Material and Methods

This study was conducted from August 12 to 30, 2024, at the Escola Municipal Prof. Dr. Amaro Fernandes de Oliveira Sobrinho, a public school located in the municipality of Surubim, in the state of Pernambuco, Brazil. The methodological strategy was developed and implemented by 111 students, comprising 53 males and 58 females, aged between 13 and 14, who were in the 9th grade of Elementary School II. The students were initially taken to Sítio Meu Refúgio, situated in the village of Sete Rancho, in Santa Maria do Cambucá, Pernambuco, Brazil. This visit was planned to provide a practical lesson that allowed direct contact with nature. In the second phase, back at the school, the students were divided into two groups to create and revitalize a vegetable garden. They planted flowers, ornamental plants, and various types of vegetables. Following these activities, a group reflection session was held, during which students shared their experiences, learned from their peers, and discussed how the practical work connected with their theoretical studies and on-site experiences. This study is qualitative in nature, being both exploratory and experiential.

### Results and discussion

Carrying out an interactive class that includes students visiting a farm, creating a vegetable garden, and revitalizing the school garden can yield significant qualitative benefits for the educational process. These practical experiences provide an immersive engagement with nature, enabling students to cultivate a deeper environmental awareness and respect for biodiversity (Spricigo, 2024). Furthermore, direct interaction with the environment fosters more comprehensive physical, emotional, and cognitive development, contributing to a more holistic and enriching educational experience (De Carvalho, 2023; Leite et al., 2023).

The first stage of the methodology involved a visit to a farm, a setting that offers various practical activities centered on environmental education. This visit was designed to enable students to connect with nature and learn about sustainable practices and local traditions. During this experience, students had the opportunity to actively engage in several activities, each with a specific objective aimed at enhancing their understanding of the environment.

Among the activities conducted, we can highlight the production of artisanal bricks. Students engaged directly with the land, gaining a deeper understanding of traditional building processes and the sustainable use of natural resources. This activity not only provided hands-on learning but also helped students cultivate an appreciation for craftsmanship and natural materials. In addition to making bricks, students milled corn and produced flour, using these inputs as raw materials for creating healthy foods. This experiential learning reinforced the connection between agricultural production and food, fostering a greater understanding of the origins of food and the importance of making informed food choices.

During the visit to the site, students had the opportunity to interact with historical utensils and artifacts. This aspect of the visit offered valuable insights into how people lived in the past, at a time when modern technology and electronic devices were nearly absent. The nostalgia associated with these objects encouraged students to reflect on the technological changes that have occurred over time and their implications for daily life and the environment. Figure 1 illustrates some of the diverse experiences encountered at the site during interactions with nature. After completing these hands-on activities, students were afforded an individual opportunity to connect with nature. This time was designed to enable each student to utilize the site for personal reflection and recreation. The significance of this period of introspection cannot be overstated, as it provided students with the chance to process their experiences, observe the natural surroundings, and cultivate a deeper appreciation for the environment (Cardoso et al., 2023). Establishing a personal connection with nature is crucial for fostering lasting environmental awareness, and this moment of individual reflection was vital for strengthening this bond.

At the conclusion of the activity period on the site, a group gathering was organized, allowing all students to come together for a snack featuring a variety of healthy foods. This moment of fellowship not only reinforced the principles of healthy and sustainable eating but also encouraged collaboration and fostered a sense of community among the students (Penz et al., 2023). Sharing a meal provided an additional opportunity for students to discuss their experiences. This social aspect of the activity helped consolidate the lessons learned and strengthen relationships among students, promoting a more cohesive and collaborative

learning environment (Zottele & Pinho, 2024). Figure 2 illustrates a moment of reflection and recreation, as well as the students enjoying their collective snack.



**Figure 1.** Arrival of students at Sitio Meu Refúgio (A), production of artisanal bricks (B), flour house (C), milling and preparation of flour (D), grinding of spices (E) and corn (F) respectively.



**Figure 2.** Moment of individual recreation (A) and collective reflection on environmental preservation (B) and collective snack (C) respectively.

The second part of the methodology was conducted at the school, where specific areas were selected for the establishment of a vegetable garden and the revitalization of the existing garden. This phase involved the practical application of the knowledge gained during the site visit and provided students with the opportunity to utilize their skills and creativity to cultivate a greener and more sustainable environment within the school. By dividing the students into two large groups—one responsible for constructing the vegetable garden and the other for revitalizing the garden—each group was able to concentrate on a particular aspect of the project, thereby fostering a sense of responsibility and collaboration among the participants.

The group responsible for constructing the vegetable garden was tasked with planting a variety of vegetables and fruits, including cilantro, arugula, lettuce, okra, watermelon, and papaya. This initiative aimed to educate students about food cultivation and the significance of sustainable agriculture. Working in the garden provided students with a hands-on understanding of agricultural processes and the importance of responsible food production. The experience of planting and nurturing

vegetables and fruits enabled students to develop practical skills and gain insight into the impact of agricultural practices on health and the environment (Penz et al., 2023). Figure 3 illustrates the garden's construction by the students, as well as the reuse of tires to enhance the environment's aesthetic appeal.

The group responsible for revitalizing the garden focused on incorporating a diverse array of flowers and ornamental plants, thereby enhancing the school environment and creating a more inviting space for everyone. During the revitalization process, students salvaged tires and wooden structures, which were then painted and transformed into recycled planters for growing plants in a suspended manner. This innovative approach not only promoted the reuse of materials but also fostered students' creativity in developing sustainable solutions. Converting tires and wooden structures into recycled planters was both a practical and imaginative way to advocate for sustainability and resource reuse, while also contributing to the beautification of the school environment. Figure 4 illustrates the students revitalizing the school garden, as well as introducing ornamental plants and flowers and recycling wood to enhance the overall ambiance.



**Figure 3.** Vegetable garden created by students (A), recycling of tires to decorate the space and use as vases (B), space two decorated with tires and planting (C) and vases planted with vegetables (D) respectively.



**Figure 4.** Planting of plants in the school garden by students (A), revitalization of the garden (B), recycling of wood to decorate the space (C), revitalized garden (D) respectively.

These building and revitalization activities significantly impacted student interaction, fostering feelings of affection, friendship, and camaraderie. The teamwork and collaboration required to complete the projects strengthened student bonds and created a more cohesive and collaborative learning environment (Penz et al., 2023). Engaging students in hands-on activities also encouraged reflection on the importance of sustainability and the necessity of adopting responsible practices in their daily lives (Novaes et al., 2023).

Environmental education plays a fundamental role in student learning. However, engagement with nature and the principles of environmental preservation should not be confined to merely transmitting 'green' values from educator to student, as is often the case in traditional education (Guimarães, 2010). The objective is to empower students to critically examine the values established by society and to cultivate their own awareness and commitment to environmental protection (Cribb, 2010). This critical approach is essential for fostering informed and responsible citizens who are equipped to confront the environmental challenges of the future (Nakaoshi & Fortunato, 2023).

## Conclusion

The hands-on experiences provided to ninth-grade students at Escola Municipal Prof. Dr. Amaro Fernandes de Oliveira Sobrinho have proven beneficial for their overall development. Direct interaction with nature through activities such as

visiting farms, building vegetable gardens, and revitalizing gardens not only expanded students' academic knowledge of ecosystems and sustainable practices but also significantly improved their emotional well-being and social skills. Students engaged with the importance of environmental preservation in a practical manner, facilitating the internalization of complex concepts in a more meaningful way. In addition to enhancing learning, outdoor activities contributed to students' overall well-being by reducing stress levels and promoting a more collaborative and inclusive environment. This experience also underscored the importance of integrating sustainability practices and contact with nature into the school curriculum, demonstrating that these approaches not only aid students in their learning but also prepare them to be more aware and responsible citizens in an increasingly urban and digital world. The continuity and expansion of these practices will be essential to ensure students' balanced and sustainable development.

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