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ABSTRACT

English

Continued attention to environmentally responsible behavior requires educational approaches that integrate sustainability into everyday practices.

Outdoor physical education in schools, as well as sports activities in contact with nature, can promote ecological awareness and sustainability in those who participate. This not only improves individuals' physical and mental well-being but also develops a sense of responsibility towards the environment.

This paper aims to examine the current state of the art on the benefits of outdoor physical education, highlighting its role in encouraging eco-responsible behavior and supporting sustainability. It also observes how outdoor learning environments can create moments of reflection that are useful for developing educational practices aimed at sustainability.

Italiano

La continua attenzione per portare avanti un comportamento responsabile nei confronti dell'ambiente richiede approcci educativi che integrino la sostenibilità nelle pratiche quotidiane.

L'educazione fisica all'aria aperta, in ambito scolastico, così come l'attività sportiva a contatto con la natura, riescono a promuovere la consapevolezza ecologica e la sostenibilità in chi li pratica. Parallelamente, l'educazione all'aperto sviluppa un senso di responsabilità nei confronti dell'ambiente e migliora il benessere psicofisico degli individui.

Questo lavoro vuole esaminare lo stato dell'arte sui benefici dell'educazione fisica all'aria aperta, sottolineandone il ruolo nell'incoraggiare comportamenti eco-responsabili e nel sostenere la sostenibilità. Inoltre si osserva come gli ambienti di apprendimento all'aperto riescono a creare dei momenti di riflessione utili per lo sviluppo delle pratiche educative volte alla sostenibilità.

KEYWORDS

Outdoor education, Physical education, Eco-sustainability.

Educazione all'aria aperta, Educazione fisica, Ecosostenibilità.

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Introduction

Taking care of and taking responsibility for the environment for the sake of the quality of life of future generations has been increasingly debated, so much so that it has given rise to the concept of sustainable development. The relationship between humanity and the environment has created the need to act to improve the current situation where the environment is mistreated by humankind. In this regard, educational settings have highlighted the importance of Outdoor Education, emphasizing its ability to promote the development of various skills, such as motor, cognitive, social, and environmental, through experiential learning in natural settings.

The Outdoor Education approach is aligned with the goals of the United Nations 2030 Agenda, which aims to build a more sustainable and inclusive world. Specifically, Outdoor Education addresses the following objectives: (Bexell & Jönsson, 2017):

Goals	Description
4	promotes quality education
10	aims to reduce inequalities
11	wants to encourage the creation of sustainable communities and cities

Table 1. Goals Agenda 2030

Outdoor Education is an innovative educational approach based on active learning, unique in that it takes place entirely through outdoor learning activities. This creates numerous positive effects, stimulating students' curiosity to learn new knowledge and improving problem-solving and teamwork skills (Mackenzie et al., 2018). It also promotes physical and mental well-being, as physical experiences in nature not only improve physical health but also contribute to cognitive development. Finally, it can strengthen social bonds and increase environmental awareness, promoting social inclusion (Hartig et al., 2011; Fromel et al., 2017; Pirchio et al., 2021; Pomfret et al., 2023).

Another key aspect of Outdoor Education is the ability of these activities to be designed and adapted to the needs of each individual. Consider adapted sports programs, such as trekking, accessible to people with disabilities, which have been shown to improve not only their motor skills but also their sense of belonging and self-esteem (Hamilton et al., 2023; Isidoro-Cabañas et al., 2023). Furthermore,

contact with nature has been observed to reduce stress and anxiety levels, increase motivation, and thus make the learning process immediate and accessible (Bento & Dias, 2017).

This highlights how the presence of Outdoor Education in schools can represent a concrete opportunity to enrich students' learning experiences and make them more dynamic, as it stimulates active engagement, creativity, and the development of transversal skills.

Indeed, from a pedagogical perspective, outdoor education allows for an interdisciplinary approach, integrating disciplines such as science, physical education, geography and art into a single experiential context (Neville et al., 2023).

Another key aspect of outdoor education and outdoor sports is the ability to raise students' awareness of the importance of the environment and ecological sustainability. Activities in natural settings offer a unique opportunity to develop a direct connection with the environment, promoting responsible and ecosystem-friendly behavior.

Numerous studies have shown that experiential learning in natural environments strengthens environmental awareness and encourages the adoption of sustainable practices, such as waste reduction, responsible use of resources, and active mobility (Chawla, 2020; Rickinson et al., 2004).

The objective of this study was therefore to analyze the role of outdoor education in physical education and school education, with particular attention to its ability to foster greater environmental awareness and encourage sustainable behavior. The main objective is to investigate how outdoor experiential learning can foster a more direct connection with the environment in students, encouraging attitudes of respect and care for the planet, as well as contributing to their psychophysical well-being and the development of motor, cognitive, and social skills.

1. The benefit of outdoor learning

Let's start from the assumption that the educational process as it is conceived is the result of a process that transformed outdoor education into the purely scholastic one we understand today—we might call it indoor education!

We could say that the emergence of a more dogmatic knowledge and the advent of writing—as early as the Sumerians—prepared for the structuring of places for teaching. Although outdoors, as in the case of the training of administrative and legal officials for the ancient Egyptians and Babylonians, these places were

predisposed to the hierarchical arrangement of bodies aimed at assuming a unidirectional knowledge: the classroom (Grimal, 1998).

The knowledge of ancient pedagogues was always imparted outdoors; the first scholars did not have a school and were wanderers, but even when the Academy and the Lyceum became permanent institutions, lessons were held in the garden.

The word "school" derives from the Ancient Greek *scholé*, meaning "free time" and intellectual enjoyment, the pleasurable use of one's mental faculties, not aimed at practical purposes and cultivated through dialogue. Subsequently, the term took on the meaning of "place where one devotes oneself to study," an evolution that places value on time dedicated to learning, understood as growth in wisdom, especially with the advent of Christianity (Marrou, 2025).

This means that outdoor education does not necessarily coincide with sensory education and the development of purely physical skills.

This connection between outdoor education and autonomous, free, and sensorial learning was advocated in modern times by Rousseau and, above all, by Fröbel, the first to establish kindergartens. In the kindergarten he conceived in 1837, Fröbel saw children as "plants" to be nurtured in a stimulating and safe environment, where learning occurred through spontaneous activity and play, guided by educators known as "gardeners."

This model promoted natural development, creativity, and interaction with nature, placing play as a central activity for understanding oneself and the world. Knowledge of the surrounding world is fundamental and occurs through the senses, which at the same time conditions attitudes towards the environment that derive from the thoughts, emotions and favorable or unfavorable feelings that people experience towards the characteristics of what surrounds them; Fröbelian teaching later reinforced Dewey's intuitions and pedagogy (Wasmouth, 2020).

Sensual education is important because it positively influences perception and, consequently, thoughts, emotions, and feelings (Carvalho, 2022), which influence behaviors best suited to the individual, social, and natural environment.

Carrasco (2021) proposes a transversal work methodology capable of connecting participants with nature through the senses, creativity, and emotions. Sensory perception activities aim to connect people with other individuals and with nature, which is followed by emotions, which, in turn, are explored with the help of natural stimuli.

Méndez-Domínguez et al. (2023) observed how an experience of interacting with the environment through a sensorimotor circuit offers subjects a variety of sensory cues with which they can experience the peculiarities of the environment, and therefore engage with the sounds, smells, tastes, and images of the place intentionally. This allows them to explore, select, and classify environmental stimuli, helping them to guide their actions.

When considering outdoor physical activity, it is necessary to distinguish between nations, as the prevalence of outdoor physical activity can vary from one country to another based not only on geographic and economic factors, but, above all, cultural ones.

Although they are Arctic countries, Scandinavians are among those that most promote outdoor activities; consider the concept of "friluftsliv" (meaning "outdoor life"), which expresses a true lifestyle in contact with nature (Gelter, 1999).

In North America, Australia, and New Zealand, the vast availability of parks and green spaces has fostered the growth of nature-based sports (Cordell, 2012).

Conversely, in densely urbanized countries like Japan and South Korea, limited outdoor space, high temperatures, and air pollution tend to reduce opportunities for outdoor physical activity. Despite this, in recent years, numerous green spaces and infrastructure have been created to encourage outdoor physical activity, recognizing the need to mitigate the negative effects of climate change and improve the quality of the urban environment (Asano et al., 2022).

Just as any sporting activity has positive effects on physical health (Zureigat et al., 2024), regular outdoor activities also improve cardiovascular health and reduce the risk of hypertension and heart disease (Poli et al., 2025). Particularly, practicing sports in contact with nature leads to a reduction in stress and anxiety levels, due to the reduction in cortisol production (Bratman et al., 2012), as well as the release of endorphins and serotonin, which improve mood and reduce symptoms of anxiety and depression (White et al., 2019). Other studies have shown that practicing sports in combination with natural landscapes improves concentration and memory, contributing to the development and strengthening of executive functions (Berman et al., 2008).

Outdoor activity has been associated with improved sleep quality and emotional regulation, key aspects of overall well-being (Bowler et al., 2010).

2. Outdoor school, sports and sustainability

Ecological values in environmental and outdoor education are essential for developing a healthy relationship between man and the environment and for fostering the integral development of modern man. They can be characterized as follows:

1	<i>Respect for life</i>	The recognition of human life as a value in itself, throughout its entire lifespan. It represents a fundamental pro-environmental value because it expresses respect for human dignity. Connected to it is the fundamental belief in the right of living beings to life and its defense, which shapes the imperative duty to protect all life.
2	<i>Health</i>	Concern for one's own health and that of others. The impact of a healthy natural environment on human health is scientifically proven. With the development of these diseases, humans are becoming increasingly aware that their health, and that of all living things, depends on the extent to which they live in harmony with the natural world (Tyburski, 1999).
3	<i>Sensitivity, contemplation, compassion</i>	In relation to ecological education, understood as sensitivity, indifference to the beauty of nature and environmental problems. Forming an ecological sensitivity opens the heart and mind to the world, to people, and to nature. Thanks to it, a person is not alone, but is able to live and act for others (Michalowski, 2000).
4	<i>Responsibility</i>	Understood as the duty to care for the environment, one's own health, and that of others. A responsible approach to life should be instilled in a person from the very beginning, helping them develop their life and integrate internally. Associated with responsibility is the sense of obligation to accept the consequences of one's actions, attitudes, and behaviors. Therefore, pro-environmental responsibility is a sense of responsibility for a world larger than one's own; it means going beyond one's own "ego" for the sake of the well-being of others (Dorst, 1987).
5	<i>Moderation</i>	Intended as self-control in the use of natural resources. It is an expression of awareness of

		coexistence in the world with other creatures. This coexistence does not mean living at the expense of others, but sharing and helping one another. It is a modification of one's previous lifestyle and a moderation of a consumerist approach to natural resources. Moderation should be understood as living wisely without waste (Marek-Bieniasz, 2001).
6	<i>Community, solidarity</i>	Understood as communitarianism in environmental activities. Solidarity is the willingness to participate in community affairs and respect the duties of other community members. It encompasses a sense of community between the human and natural worlds—it aims to change individual human attitudes toward the natural environment. This emphasizes that, beyond concrete differences, we should not forget the numerous connections between humans and nature. It also has a second dimension, which we can see as a path toward a civilization capable of respecting the needs of all the interests of the nonhuman world, understood as the interests of the entire lifeworld (Papuzinski, 2006).
7	<i>Job</i>	It is understood as a pro-environmental value combined with reliability, conscientiousness, and accuracy in carrying out tasks and duties, contributing to the conservation of natural resources. Specifically, the focus here is not so much on the work itself (regardless of how it is performed), but rather on emphasizing reliability and conscientiousness in its execution. Work teaches reliability and thrift, thus shaping the individual and giving them a more rounded ecological dimension.
8	<i>Courage to be</i>	Understood as boldness and authenticity in expressing and making pro-environmental choices. It means inspiring others to adopt pro-environmental behavior (living green), being a role model for others. It often involves making painful and difficult, but free, pro-environmental choices and exposing oneself to other people and opinions for the sake of integrity of conscience.
9	<i>Justice, peace</i>	Understood as the ability to make the right pro-environmental choices. Pro-environmental wisdom is

		the intentional contribution to environmental protection through the right pro-environmental choices. Ecological wisdom is the art of living in harmony with nature, that is, living with a sense of belonging to nature and the world. It is not just a recipe for protecting nature, but a recipe for living.
10	<i>Love</i>	Associated with a deep affection, a sense of a strong emotional connection with all of creation—humanity and all of nature—is the desire to be together and share happiness. All values are based on it. Love for nature is a strong sense of emotional connection and being with all of creation; it is the willingness to give of oneself and serve it selflessly.
11	<i>Hope</i>	Understood as a positive attitude toward the future, the belief in the possibility of overcoming the ecological crisis. Allowing us to look to the future—our ecological future—with confidence motivates people to act, gives them the strength to fight adversity and undertake pro-ecological actions. Hope, therefore, provides the strength to guide other ecological values (Gola 2022).
12	<i>Harmony with Nature/Connection with Nature</i>	It restores a sense of security, trust in life, and positivity about the future. It helps you find and experience your true self, your humanity.

Table 2. Ecological values in environmental education

Outdoor sports are not only beneficial for improving physical and mental well-being (Matos et al., 2017), but also represent a useful way to promote ecological awareness and commitment to environmental sustainability (Louv, 2005). The topic of the environment is increasingly relevant as climate change is generating devastating impacts on the environment itself. This global emergency requires responsible behavior and raising awareness among younger generations about protecting the planet.

Outdoor sports, and outdoor education in schools, offer students the opportunity to immerse themselves in natural environments, developing a deep connection with nature. This direct contact fosters a greater understanding of biodiversity and the fragile ecological balances that characterize ecosystems.

Regular contact with natural landscapes has been observed to positively influence psychological well-being and empathy toward living beings, as well as fostering

inclusion and acceptance of diversity and the desire to protect the environment (Gladwell et al., 2013). The above highlights how outdoor sports offer a unique opportunity to develop ecological awareness, encouraging young people to become responsible citizens committed to environmental protection. Therefore, outdoor sports educate people of all ages about the sustainable management of resources, the importance of biodiversity, and the need to minimize human impact on the environment (Salazar et al., 2024). This highlights the need to create educational contexts for new generations that support this awareness (Børresen et al., 2023).

Shared experiences in nature through sports include the ability to create a sense of community and a collective commitment to sustainability. Furthermore, it is important to remember that group sports practice improves the ability to collaborate, thus enhancing the ecological aspect and joint actions to address environmental challenges. This underscores how these experiences can encourage young people to undertake ecological initiatives even outside of school (Sandford et al., 2008).

3. Outdoor activities importance

Based on what has been reported so far, the importance of including outdoor physical activity and sports in educational settings is clear.

The inclusion of outdoor activities in physical education curricula represents a fundamental educational strategy that transcends the traditional approach, offering a departure from traditional teaching practices. By integrating conventional teaching approaches with outdoor physical activity and contact with nature, schools enrich the learning experience and promote students' holistic development.

It should be noted that there is no perfect model, no approach that solves all the problems of interest to eco-sustainable education, nor is there a single method or approach that is successful in all contexts and for the variety of objectives pursued. It is advisable to master a wide range of fundamentals, as teachers must address different situations and problems depending on the contexts in which they operate.

Vallejo R. G. (2024) states that each context is optimal for applying one approach or another, depending on the case, as well as for making complementary efforts, where sustainability addresses different levels of conflict, from the theoretical to the operational, but where educators begin to produce knowledge that arises from the analysis of reality, to demonstrate related pedagogical strategies.

Outdoor living encourages active and hands-on learning, where students are not simply recipients of information, but become active participants in their own educational process. This learning modality allows for the development not only of physical skills, but also of social, cognitive, and transversal skills, such as resilience, leadership, and risk management, all essential for personal growth.

Gutiérrez (1995), with his concept of multidisciplinary transversality, explains how eco-sustainable education loses its specific character to become a construct that permeates all spheres of school knowledge. Transversality thus becomes a way to educate about the different aspects of reality:

- educate about health and proper consumption,
- educate about peace,
- educate about art and culture,
- educate about the responsible use of new technologies,
- educate about conservation and respect for the environment,
- educate about the relationship of the body in space,
- educate about harmonious coexistence between people of different cultures.

These values allow students to learn how to learn, to live in harmony with others, to make decisions about what to do, and to do so in the most ecological and sustainable way, generating real and meaningful learning.

Teaching outdoor sports, in addition to offering an opportunity to integrate theory with practice, is an opportunity to create interdisciplinary projects and exploratory STEM workshops, thus breaking the monotony of the educational system.

Integrating student curricula with outdoor sports requires appropriately trained teaching staff to develop structured programs that maximize the benefits of these experiences.

Recent studies have shown that specifically training teachers in outdoor methodologies, in addition to developing the skills to integrate activities into school curricula, ensures students have a more structured and safe school experience; furthermore, it significantly enhances teachers' perception of self-efficacy (Dyment & Potter, 2015).

Méndez-Domínguez, Mendoza, and Avilés (2023) conducted a study on interdisciplinary outdoor classrooms, which included tasks applicable from the second cycle of Early Childhood Education, with students from the Bachelor's Degree in Pedagogy and Early Childhood Education. After analyzing their perception of the intervention, the results showed a high degree of agreement among university students regarding the learning strategies and resources related to interdisciplinary outdoor classrooms in the areas of early childhood care, personal and family guidance, developmental psychology, and motor skills teaching in early childhood, demonstrating their awareness that joint actions with coordinated and comprehensive approaches can ensure the acquisition of the skills necessary to promote sustainable and quality education.

A further example of the educational value of nature is provided by the Spanish forestry school called "Bosquescuela," which represents a model of sustainable schooling, consistent in both form and content, and is currently the only approved educational model for secondary preschool in Spain that develops an outdoor curriculum. A wide range of pedagogical options are developed outdoors—forests, countryside, beaches, parks, urban areas—so that the natural environment can satisfy all students' exploratory desires, with curiosity as the primary driver of learning. The curriculum includes opportunities for children's psychomotor, cognitive, and emotional development through free and spontaneous play, excursions where they run, climb, and learn about the environment, and introductory reading, writing, and mathematics lessons using natural elements such as stones, leaves, branches, and so on. (Bruchner, Aragón, 2021).

Significant space must be dedicated to bodily expression in the natural environment, such as dances performed since ancient times—some tribal cultures still dance around fire or water—or celebrations of the solstice and equinox (Murga, 2023). Thus, the importance of the body in its relationship with the environment emerges; conversely, we could say that a place provokes or suggests a possible human reaction.

Movement, or the absence of movement, takes on meaning and is the protagonist that invites us to feel, express, and create our relationship with the natural environment in an uninhibited way, constantly reconstructing new scenarios of ecological action as a path to self-knowledge, evolution, and awareness.

This new way of connecting with nature, where the body expresses and transforms creatively, allows emotions, sensations, and thoughts to be expressed in a meaningful yet playful way. In a certain sense, this approach can be linked to the

playfulness of life in nature, and more specifically to a playful category whose main characteristics are spontaneity, freedom, and fun (Viñes, Ramirez, 2020). This transformation or fusion of the body with nature can be achieved individually, but it gains greater power in collaborative settings, where collective creation and improvisation through experimentation with the body in motion, emotionally connecting with nature and its elements, stimulate participants' bodily and spatial awareness, develop their critical sense, and elevate their autonomy and confidence to a new, more humane and ecological level of awareness (Pawlowicz Sosnowska et al. 2025).

Conclusions

In conclusion, this study highlights that outdoor education and outdoor sports, as well as physical education in schools, are key educational strategies for enhancing experiential learning and the holistic development of students. This approach not only promotes physical, cognitive, and social skills, but also instills a profound environmental awareness, helping to develop environmentally responsible citizens.

Numerous studies have shown that integrating outdoor sports activities into teaching stimulates curiosity and motivation, as well as improving students' psychological and physical well-being. Direct interaction with the natural environment translates into greater empathy for ecological issues and an active commitment to sustainability, thus supporting the goals of the United Nations 2030 Agenda.

It is therefore crucial that educational institutions recognize the importance of these programs and invest in teacher training and the creation of adequate infrastructure. Only in this way will it be possible to maximize the benefits of Outdoor Education and ensure that students not only acquire knowledge and skills, but also develop a sense of responsibility towards their environment.

In a global context where environmental challenges are increasingly pressing, the adoption of teaching methodologies that integrate Outdoor Education represents a decisive step towards a sustainable and inclusive future.

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