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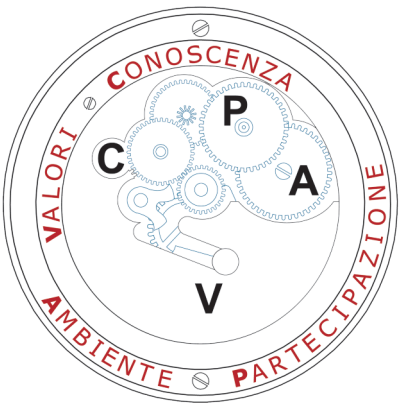

Special Issue

Re-thinking Social Inclusion from the Perspective of Sustainability

Guest Editor: Prof. Domenico Tafuri

FrancoAngeli

SEMESTRALE DELLA FONDAZIONE SIMONE CESARETTI 10.'25 N°1 Special Issue

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Sommario

Re-thinking Social Inclusion from the Perspective of Sustainability

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Editorial

by *Domenico Tafuri*[*]

The concept of Sustainability is not new in literature, but in recent times, it has experienced such an expansion that it is possible to find references to sustainability in different disciplines (law, management, architecture, etc.) and in different areas that affect "social living" (from scientific literature to professional manuals and popular communication). In all cases, the references are explicitly aimed at supporting and sustaining a new development paradigm.

The traditional model of economic development, of the seventies, was the subject of strong criticism, as, among scholars, the hypothesis of the inability of the Earth to meet the needs of an ever-growing humanity was advanced. Starting in 1967 and during the 1970s, Paul R. Ehrlich (biologist) began to denounce in catastrophic terms the ecological risk associated with the population boom.

A second alarm bell was raised in 1972 when the "Limit to growth" was published, promoted by the Club of Rome and produced by MIT in Boston; it is a study that, based on trends in population, resources, energy, pollution and industrial development, predicts a scenario of growing shortage of resources such as to lead the world economic system to collapse by the twenty-first century (Meadows et al., 1972). It is, therefore, in the 70s that the awareness of a problem linked to the relationship between natural resources and their exploitation emerges.

To avoid this scenario, which is nothing short of apocalyptic, and to avoid the limits of development, the tool proposed by the authors of the Report is the strategic planning of the forms of use of natural resources. In this sense, it is recognized that nature has a fundamental role in the economy towards

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the adoption of “Sustainable Development”. In the 80s the expression “sustainable development” became very popular, especially thanks to the publication in 1987 of the document “Our Common Future”, drawn up by the World Commission on Environment and Development WCED; better known as the “Brundtland Report”: “Sustainable development is a development that guarantees the needs of current generations without compromising the possibility that future generations will be able to meet their own”. The concept of sustainable development highlighted involves limits, although not absolute, imposed by the current state of technology and social organization, economic resources and the capacity of the biosphere to absorb the effects of human activities.

In 2001, the definition of Sustainable Development was enriched with a further concept, that of cultural diversity. This is the central theme of the “Universal Declaration on Cultural Diversity”, of UNESCO; «… cultural diversity is as necessary for humanity as biodiversity is for nature»; it can be considered “one of the roots of development understood not only as economic growth, but also as a means of leading a more satisfying life on the intellectual, emotional, moral and spiritual levels”. In this sense, cultural diversity is the common heritage of humanity and should be recognized and affirmed for the sake of present and future generations.

In February 2008, the President of the French Republic, Nicholas Sarkozy, dissatisfied with the current state of statistical data concerning the economy and society, asked Joseph Stiglitz (President of the Commission), Amartya Sen (Councilor) and Jean Paul Fitoussi (Coordinator), to create a Commission, later called the “Commission on the Measurement of Economic Performance and Social Progress” (CMPEPS). The Commission’s objective was therefore to identify the limitations of GDP as an indicator of economic performance and well-being, including problems related to its measurement, and to reflect on any additional information that might be needed to develop more reliable indicators of well-being.

The Organization for Economic Co-operation and Development (OECD) ‘How’s Life’ report describes some of the essential aspects of life that shape people's well-being and is based on a multidimensional framework covering 11 dimensions of current well-being (income and wealth, work and earnings, housing, health, education, work-life balance, environment, social connections, civic engagement, security and subjective well-being) dividing them into two macro groups: “Material living conditions” and “Quality of life”. According to the OECD, the sustainability of this well-being requires the preservation over time of the four stocks of capital (natural, human, economic and social). In particular, the preservation of human capital in terms of availability, quality, diversity is of great importance. With respect

to diversity, it becomes essential to include each person in development processes oriented towards the sustainability of individual and collective well-being.

Therefore, the biggest and most demanding challenge that our society is facing in recent years is certainly that of fostering a cultural and educational change that allows the new generations to build a better, fairer, more inclusive and sustainable world than has been done so far. Today, when the common and global challenge is the transition to more inclusive and resilient societies, it is from the educational processes that we must start. In this sense, it becomes essential to rethink the education and training system in a sustainable way in order to promote a global society oriented towards cooperation and respect for individuals. The construction of sustainability, in fact, is considered a fundamental educational value in the construction of inclusive processes. Promoting sustainability education from an inclusive perspective means planning and organizing coordinated changes according to the principle that the benefits of economic growth must be shared widely, leaving no one behind and satisfying the needs of the present without compromising future generations. In essence, training in sustainability and inclusion means that everyone can access the Institutions, resources and opportunities necessary to live fully in society.

In this sense, the contribution of the United Nations 2030 Global Agenda appears relevant, which, through the 17 Sustainable Development Goals (SDGs), signals the widespread relevance of sustainability at a global level and, at the same time, tries to provide the grammar of a common language, oriented towards development through the adoption of a sustainable growth strategy that follows the principles of non- discrimination, equal opportunities and equal dignity for all forms of diversity. Inclusive education through education for sustainability are essential aspects for those educational and work contexts that intend to become engines of change as they are ready to face present and future challenges and to promote excellence through the value of diversity. In this perspective, training for sustainability means planning and organizing coordinated changes that: 1) Place the person and his well-being at the center, through a global plan of investments and policies aimed at protecting health; 2) Increase the culture of inclusion, recognizing the different forms of vulnerability, in order to ensure equal opportunities for access and participation; 3) Enhance environmental sustainability, with positive effects on the well-being of the territory and its population. In this sense, Motor and Sports Activities represent a unique tool in support of this global action plan, as also recognized by multiple UN resolutions and reports, for key role they can play in achieving economic development; in the promotion of tolerance, respect,

and the emancipation of individuals and communities; in pursuit of objectives related to health, quality education and social inclusion. Motor and Sports Activities have always played a fundamental role in our culture, social and family, thanks to their educational function. A mirror of our society, they are able to involve young people and all citizens, promoting sustainable life models and virtuous behavior practices. According to this perspective, the training model that is desirable to achieve places as its central nucleus the participation, collaboration and promotion of problem-oriented and decision-making thought processes. Educating for sustainability means rethinking the pedagogical, social, economic, cultural discourse towards a relational-systemic approach, which assumes the concept of network as the primary organizing concept. It is a matter of investing in a radical change of mindset with respect to the global approach to sustainability. A change of mindset entrusted above all to schools and universities and extended from childhood to the entire course of life, in the plurality of places of life and experience. Each and every one, without distinction, is called to "their part well".

The task of the Educating Community must be to promote "Sustainability Literacy", that complex of knowledge, skills and provisions that allow people to engage deeply in building a sustainable future and to make informed and effective decisions with a view to life-long learning. Educating, therefore, individuals capable of individual and collective fulfilment, sharing their experiences and co-designing the actions to be implemented to achieve levels of well-being that are compatible with the precarious balances of the ecosystem in which they live.

In this Special Issue, the Authors explore, from different but complementary angles, the role of Sport, School, Pedagogy, Psychology and Educational Policies in promoting more inclusive, aware and resilient communities. In a time marked by environmental crises, social inequalities and cultural transformations, the contributions offered outline possible paths towards an integral education that puts the person, the context and the planet at the center.

The first common thread is that of Sport as an educational, social and environmental lever. The study "Sport as a Tool for Inclusion and Sustainability in Secondary School: A Qualitative-Quantitative Analysis" shows how structured sports practices can foster a sense of belonging and inclusion among students, concretely responding to the goals of the UN 2030 Agenda. To complete, the Article "Outdoor sports as a tool for environmental sustainability: an educational model for schools and communities" proposes a model of outdoor physical education that integrates movement and ecological awareness, strengthening young people's responsibility towards

the territory and the environment. From another perspective, “The importance of making sport sustainable” draws attention to the contradictions of the modern sports system, which on the one hand is affected by the effects of climate change, and on the other hand contributes itself to the environmental impact. What emerges is an invitation to the sustainable transformation of the sector, from infrastructure to events to sports culture. In this framework, the Article “Physical activity for the promotion of cognitive functions: the role of the exercise-induced Brain Derived Neurotrophic Factor in muscle-brain crosstalk” adds a neurophysiological perspective, deepening the role of physical activity in the promotion of cognitive functions. The production of myokines, including Brain-Derived Neurotrophic Factor (BDNF), shows how body movement is also a vehicle for brain well-being, enhancing neuroplasticity and neurogenesis. The idea of Sport as an educational and preventive tool, capable of acting in depth on the integral development of the person, is strengthened.

A second thematic axis concerns the intertwining of sustainability, mental health and individual behavior. The Article “Sustainability and eco-anxiety: strategies for addressing environmental concern” highlights how emotions related to climate change, often negatively labeled as “eco-anxiety”, can instead constitute a starting point for responsible action, if properly recognized and accompanied. On a complementary level, “Environmental sustainability education and its impact on psychological well-being: a cognitive-behavioral approach” explores the potential of cognitive-behavioral therapy (CBT) to foster the adoption of sustainable lifestyles, addressing the cognitive and emotional barriers that hinder change. Both contributions underline the importance of integrated approaches, capable of combining the psychic and environmental dimensions in the construction of an ecological citizenship.

The reflection expands with two Articles that place sustainability in a perspective of social justice and community cohesion. “Competing Futures: Reconfiguring Sustainability in US Education Policy from Equity to Meritocracy” critically analyzes the language of US education policies, showing how the concepts of equity, inclusion and merit are being redefined (and sometimes opposed) in the construction of sustainable futures. From a more practical perspective, “Promoting social well-being and psychophysical health through environmental restoration” documents the positive impact of environmental regeneration initiatives promoted by local associations, capable of strengthening social ties, improving psychophysical well-being and rooting a culture of caring, both for people and places. Within this perspective, the Article “Designing Inclusive and Sustainable Cities: an urban future for All” proposes a holistic vision of urban policies as a space

for integration between social inclusion and environmental sustainability. The Contribution highlights how the design of cities must aim at the removal of physical and symbolic barriers, promoting equity in access to urban resources, civic participation and quality of life. The city thus becomes an educational scenario, in which the organization of space reflects and shapes social relationships and collective values. Finally, the Article "Dual Career Athletes and Sustainable Development: A Model for the Future of Sport" introduces a virtuous model that integrates training, inclusion and sustainability. The experience of dual-career athletes shows how it is possible to reconcile sports performance and personal development, mitigating psychosocial risks and offering opportunities for growth beyond the competitive career. This perspective reinforces the idea of a sustainable sport also from a human and professional point of view, based on policies that value the person in his or her entirety.

Taken together, these Contributions outline a rich and articulated framework in which Sustainability is no longer just a technical or environmental issue, but is configured as an educational, transformative and relational horizon. It is an invitation to rethink school practices, public policies, sports activities and individual strategies in an ecological and inclusive way. But it is also an appeal to a shared responsibility, that is, to build possible futures that are at the same time just livable and desirable.

I would like to thank the authors for their enthusiasm for this project and the reviewers for their comments. My special thanks go also the journal staff and its editorial board.

Designing Inclusive and Sustainable Cities: an urban future for All

by *Patrizia Belfiore*[*], *Livinus Ogbondah*[°], *Domenico Tafuri*[*]

Abstract
Social inclusion, sustainability and the management of urban spaces are central themes in modern urban development policies, in a global context marked by increasingly complex economic, environmental and social challenges. With the process of urbanization, cities face the delicate task of ensuring equal opportunities for all citizens, without discrimination based on socio-economic, cultural or physical factors. Social inclusion, in this context, becomes essential to avoid the risk of marginalization of specific social groups, such as people with disabilities or the most vulnerable sections of the population. The aim of the article is to highlight the close connection between social inclusion and sustainability and how these two aspects can reinforce each other in achieving the Sustainable Development Goals.

Key words: Social inclusion, sustainability, disability, tactical urbanism, design, community

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Introduction

Designing inclusive and sustainable cities is a complex challenge, but one that is fundamental to building a more just and livable society. In a world facing rapid social, economic and environmental transformations, urban design must evolve to meet the new needs of people and urban settings. Cities, now home to more than half of the world's population, are the centers of social, economic, and cultural interaction, but also places where

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inequality, physical barriers, and social exclusions may be most evident (Chen et al., 2022). In this scenario, inclusiveness and sustainability become two indispensable pillars for urbanization that is not only functional but also equitable and environmentally friendly. Urban inclusiveness implies that every individual, regardless of his or her physical, mental, sensory or economic condition, has access to the same rights and opportunities in urban life. This means that the city must be designed to break down physical and social barriers, providing opportunities for all its inhabitants to actively participate in social, economic and cultural life (Kohon, 2018).

An inclusiveness that is not limited to mobility or accessibility, but also embraces political participation, access to health, education and services, as well as the opportunity to live and work in an environment that promotes the mental and physical well-being of all citizens. Integrating the concepts of inclusiveness and sustainability is, therefore, the key to designing cities that are able to respond to the social, economic and environmental challenges of our time. The evolution of sustainable cities from the perspective of inclusiveness represents a challenge and an extraordinary opportunity to transform the way we conceive of the urban environment (Carnemolla et al., 2021; Mirzoev et al., 2022). Traditionally, urban development has focused primarily on economic and infrastructural aspects, often neglecting social inequalities and the needs of vulnerable communities.

However, in recent decades, growing awareness of social, economic and environmental problems has led to the emergence of a new model of cities, where sustainability and inclusiveness are seen as two sides of the same coin. Today's sustainable cities must respond not only to the need to reduce environmental impact and improve quality of life, but also ensure that the benefits of these improvements are distributed equitably among all social groups. A key aspect of this evolution concerns the conception of urban space as a common good, accessible to all. To succeed in building inclusive and sustainable cities requires a radical change not only in urban design, but above all, in the educational system so that it can educate for a healthy relationship with the environment and with others. An integrated approach that combines inclusiveness, education, environmental sustainability, and intelligent design of urban spaces can help address the challenges of the present and anticipate future ones (Losasso, 2017).

In this context, integrated and holistic urban design that respects the principles of inclusiveness and sustainability is the only way forward to ensure that our cities are livable, resilient, and just for present and future generations. The aim of this article is to explore the link between disability, inclusiveness, and sustainability, highlighting how these three concepts are

interconnected and how they can be integrated into everyday policies and practices.

Disability and sustainable cities

The issue of disability in sustainable cities is a crucial aspect that reflects a community's commitment to building an inclusive, equitable, and accessible urban environment for all. Sustainable cities, to be truly sustainable, cannot be limited to managing natural resources or promoting sustainable mobility, but must also address the needs of all citizens, including people with disabilities, who make up a significant part of the population (Daszkiewicz, 2023). Integrating disability into urban design means adopting an approach that ensures equal opportunities and accessibility, removing physical, social, and cultural barriers that limit the participation of these people in city life (Di Palma & Tafuri, 2016). Several elements intervene and must be considered in a kind of circular relationship that can allow the creation of an urban model that aims to be inclusive for all (Fig. 1).

Fig. 1 - Inclusive circular model

Source: own elaboration.

- **Physical accessibility and mobility**

A sustainable city must first and foremost be accessible. Physical accessibility is one of the most obvious aspects when it comes to urban disability, and it involves all aspects that affect the use of public spaces, transportation, and buildings. Public facilities and transportation must be designed to ensure that people with disabilities can move freely and safely.

This means, for example, that handicap ramps and accessible elevators should be a norm, not an exception, and that public transportation services should be easily accessible to those with reduced mobility, through buses, streetcars, and trains with dedicated and accessible spaces.

- **Technology and innovation**

Assistive technologies are another key tool for ensuring inclusion in sustainable cities. From home automation that makes homes more accessible to those with mobility disabilities, to mobile applications that provide information on accessible routes or the accessibility conditions of public transportation and buildings, technology can make cities more inclusive.

- **Social inclusion and participation**

Participatory democracy is an essential element of an inclusive city, enabling all people, including those with disabilities, to be heard and to help create an environment that meets the needs of all. Sustainable cities must also provide opportunities for social and cultural participation, ensuring that people with disabilities have access to cultural, sporting and recreational events. This means designing public spaces and facilities that enable everyone to participate in and enjoy the social life of the city without barriers.

- **Inclusive housing and housing policies**

Another crucial issue concerns housing accessibility. Housing must be designed so that it is suitable for the needs of people with disabilities, without creating a separation between “normal” homes and homes for people with disabilities.

- **Inclusive cities and social justice**

Designing sustainable cities from a disability perspective is not only about taking technical or infrastructural measures, but also about recognizing the right to inclusion as a fundamental part of human rights. An inclusive city is one that not only welcomes people with disabilities, but does everything to ensure that every person can enjoy civil, social and cultural rights without discrimination.

Only through planning that considers the needs of people with disabilities and ensures universal access to urban goods, services and opportunities can cities become truly sustainable and just places where every citizen has an equal opportunity to live, grow and participate.

Tactical urbanism, disability and sustainability

Tactical urbanism is an innovative and dynamic response to the challenges of disability in urban settings, offering temporary but highly effective solutions that can immediately improve the accessibility of public spaces. It involves rapid and low-cost interventions that aim to transform city spaces through simple but meaningful modifications (Bazzu P., 2019). Unlike traditional urban planning, which often requires years of study and implementation, tactical urbanism allows for the testing of temporary and adaptable solutions that can quickly respond to the daily needs of citizens with disabilities. These interventions not only improve physical accessibility, but also create greater collective awareness about the importance of an inclusive city (Cabe, 2006; Marcus & Colding, 2014). The changes introduced, although often temporary, can be used as experiments that, if they prove to be effective, can later be integrated into long-term urban planning projects. In this sense, tactical urbanism not only responds to an urgent need for accessibility, but also becomes a catalyst for broader reflection on urban policies, pushing administrations and citizens to consider disability as a condition that affects all of society and not just a part of it.

Tactical urbanism, in addition to fostering accessibility for people with disabilities, also aligns with the principles of sustainability, creating urban spaces that are more inclusive, but also ecologically responsible and economically beneficial (Dempsey & Burton, 2012). Indeed, tactical urbanism interventions are usually temporary, low-cost, and low environmental impact, but they have the potential to generate lasting changes in the way we think about and design cities. Adopting simple solutions, such as converting parking lots to pedestrian areas, installing accessible benches, or creating temporary urban gardens, not only improves the quality of life for people with disabilities, but also promotes environmental sustainability by reducing soil sealing, improving air quality, and increasing urban biodiversity. In addition, tactical urbanism interventions often promote sustainable mobility, encouraging the use of bicycles and public transportation, and limiting the use of private cars (Monno & Sibley, 2015). For example, creating safe and accessible bicycle lanes, as well as protected pedestrian zones, not only makes the city more usable for people with disabilities, but also reduces air and noise pollution, promoting a healthier lifestyle that is less dependent on private vehicle use. In this way, tactical urbanism contributes to smarter management of urban space, which integrates accessibility and sustainability in a complementary way. Social sustainability is another key aspect of tactical urbanism, which results in

improved integration of people with disabilities into daily life in the city (Haarstad, 2015).

Public spaces designed with an eye toward accessibility are more livable and safer for all, reducing isolation and promoting social cohesion (Eukn, 2014). The inclusion of people with disabilities in social and economic dynamics thus becomes a central element in the creation of sustainable cities that are not only concerned with the environment, but also with the well-being and participation of all citizens (Milani & Raimondo, 2017). Tactical urbanism, in this sense, becomes a tool for building more resilient communities, capable of addressing the challenges of climate change and social inequality through practical, collaborative, and sustainable solutions.

Can tactical urbanism improve the situation of disabled people?

Tactical urbanism, as noted above, offers numerous examples of how accessibility for people with disabilities can be improved quickly, cheaply, and effectively (McLaren & Agyeman, 2018; Liu & Plail, 2024). These interventions, although often temporary, can have a significant impact on people's daily lives, transforming urban spaces into more inclusive and functional environments.

Here are some examples of tactical urbanism applied to disability:

1. **Creation of temporary sidewalks and ramps**: Tactical urbanism interventions can involve the rapid installation of mobile ramps or the modification of the pavement in order to ensure a smooth and easily walkable surface. These interventions can be done with inexpensive materials, such as non-slip rubber strips or mobile platforms, which improve the mobility of people in wheelchairs or with other mobility difficulties.
2. **Temporary and accessible parking spaces for the disabled**: During public events or in high-traffic areas, it is possible to temporarily transform parking spaces into areas reserved for people with disabilities, ensuring immediate accessibility. In addition, larger and more well-marked parking spaces can be adopted, with a design that provides for the minimum distance necessary to allow easy and safe mobility.
3. **Safe and secure pedestrian areas:** Tactical urbanism can include the creation of temporary pedestrian zones or areas protected by traffic barriers, improving safety and accessibility for people with visual or motor impairments. For example, installing temporary traffic separators

or protective barriers can create safe walking spaces, reducing the risk of accidents and making the city more welcoming.

4. **Accessible bike lanes and paths:** Cycle paths can be designed to ensure access for people with motor disabilities, creating paths on smooth pavements free of obstacles. In addition, installing tactile or audible signs along these routes can help people with visual impairments find their way around the city better while promoting sustainable mobility.
5. **Visual and tactile signage systems:** Tactical urbanism can include the installation of tactile and visual cues to orient people with sensory disabilities. For example, tactile strips on sidewalks to help blind or visually impaired people find their way around, or the installation of light signals that indicate safe pedestrian crossings. These interventions, which can be easily implemented, can make urban spaces much safer and easier to navigate for people with sensory disabilities.
6. **Temporary public spaces for social inclusion:** Tactical urbanism interventions can include the creation of accessible temporary public spaces where people with disabilities can meet, socialize, and participate in events. These spaces can be furnished with accessible benches, ramps and paths that allow people with mobility difficulties to move freely and participate fully in the social life of the city. In addition, the creation of temporary green areas or urban gardens can help improve the quality of the urban environment for all citizens, promoting inclusivity and sustainability.
7. **Temporary adaptation of public transportation stops:** Bus and metro stops can be adapted with quick interventions, such as adding inclined planes to improve accessibility or installing sound signals for people with visual impairments. These interventions aim to ensure that people with disabilities can access public transport more easily and safely.

In Italy, several projects attributable to tactical urbanism integrate the needs of people with disabilities with the goal of creating sustainable cities. Here are some significant examples (Tab. 1).

Tab. 1 - Italian projects for sustainability and inclusion

IRMA project in Pavia	**Oasi Rossi in Santorso (Vicenza)**	**Sustainable mobility initiatives in Bologna**	**"Accessible cities" project in Milan**
As part of the Horizon 2020 program, the University of Pavia and the City developed IRMA (Integrated Real-time Mobility Assistant), a free Android and Internet application. IRMA optimizes intermodal transportation routes by providing real-time information on traffic, weather, road conditions, and public transportation availability. The app includes interactive maps and multilingual support, with Braille extensions and adapted interfaces for the elderly and people with disabilities, promoting more sustainable and accessible urban mobility.	Oasi Rossi is a historic park managed by the non-profit Nuovi Orizzonti Social Cooperative, which promotes inclusivity through various initiatives. In 2016, an inclusive play area was inaugurated, designed to be accessible to all children, regardless of their abilities. The games, made from PEFC-certified local wood, include slides, swings with baskets, and child-sized tables. This project promotes social inclusion and accessibility, contributing to a more cohesive and sustainable community.	Bologna has implemented several solutions to improve accessibility and urban sustainability. For example, low-impact buses with wheelchair ramps have been introduced, and pedestrian paths with tactile paving have been created for people who are blind or visually impaired. These interventions improve the quality of life for residents and visitors, promoting greener and more inclusive mobility.	Milan has launched the "Accessible Cities" program with the aim of eliminating architectural barriers and improving accessibility of public transportation. Interventions such as the installation of elevators and ramps in subway stations, and the creation of safe and well-marked pedestrian paths have been carried out. These efforts contribute to a more inclusive city that is attentive to the needs of all citizens.

Source: own elaboration.

Participation policies and educational practices

The role of local communities in improving the urban environment is crucial, as the people who live in a given area on a daily basis are the most

aware of the issues and potential of their environment (Ives et al., 2018). Indeed, local communities are not only custodians of the social, cultural, and natural heritage of their cities, but they are also the key players in the transformation process that aims to make the urban environment more livable, sustainable, and inclusive (Tanrikul, 2023; Tuner, Henryks, & Pearson, 2011). Communities can contribute to improving the urban environment in various ways, starting with the management and care of public spaces. These spaces not only provide places for recreation and socialization, but also serve an important ecological function by improving air quality, promoting biodiversity, and helping to reduce the heat island effect. In addition, local communities are key in promoting sustainability practices, such as recycling, waste reduction, and the use of renewable energy, which can have a positive impact on the urban environment globally (Amin & Thrift, 2005). Another key aspect is the ability of communities to raise awareness and educate citizens about the importance of ecologically responsible behaviors through awareness campaigns, events, and educational activities that promote sustainable lifestyles and specific sports activities (Greco et al., 2019; Cataldi et al., 2019; Scamardella et al., 2020). The active participation of communities in improving the urban environment is not only limited to the ecological sphere, but also extends to creating safe and inclusive public spaces, promoting local culture and traditions, and building networks of solidarity and cooperation that strengthen social bonds (Borgogni, 2020). When communities are involved in the design and management of their spaces, greater responsibility and care for the environment is felt, creating a virtuous circle that not only physically improves the city, but also makes it more cohesive, resilient and dynamic. In this awareness-raising scenario, schools represent the ideal place for the formation of individuals educated in sustainable culture (Anderson, 2014). The role of the school in educational and sustainable environmental practices for people with disabilities is crucial, as it represents one of the main spaces where new generations can be trained and made aware of the importance of sustainability, adapting it to the specific needs of individuals (Borgogni & Di Gennaro, 2016). Indeed, school is not only a place of theoretical learning, but can become a laboratory of practical experiences in which people with intellectual and relational disabilities learn to live more consciously and actively about caring for the environment (Healey, 2010; Hestness et al., 2016). By adopting an inclusive approach that takes into account different cognitive, motor, and sensory abilities, schools can design targeted activities that allow each student to participate according to his or her abilities (Li & Monroe, 2019; Buissink-Smith et al., 2011). For example, involving students in school gardening projects, recycling and material recovery activities, or

running small environmental sustainability projects stimulates a sense of responsibility and active participation. These practices not only contribute to the formation of ecological awareness, but also to the self-sufficiency and self-esteem of students with disabilities, fostering social integration and the building of positive relationships within the school community (Galli Laforest, 2017; Kytta, 2018). In addition, the school also has the opportunity to raise awareness among families and communities, promoting cultural change that embraces the principles of environmental sustainability and inclusion, creating a learning environment that is truly inclusive. In this context, the school becomes an agent of change, a place where sustainability is not just a theoretical issue, but a daily practice that involves every aspect of school life and is fundamental to the autonomy and dignity of people with disabilities.

Conclusions

Sustainable cities must be thought of as places of co-creation where citizens, especially those from more disadvantaged groups, can actively participate in the planning of their urban spaces. In this way, cities can become engines of change, where environmental sustainability translates into social and economic benefits for the whole community. Moreover, it is crucial that cities of the future be resilient not only to extreme events, but also to social inequalities and the sensitive issue of disability. An inclusive city must be able to respond effectively to emergencies, protecting vulnerable people and ensuring that every citizen can access vital services in a crisis, such as during times of pandemic or following natural disasters.

Thus, urban resilience also involves building a social safety net that supports the most vulnerable, enabling them to cope with times of hardship without being excluded from basic resources. In sum, the evolution of sustainable cities with a view to inclusion represents a radical and necessary transformation that must address and overcome historical, environmental and economic inequalities.

The cities of the future must be designed to be more equitable, greener, more resilient, and more participatory, where every person, regardless of their economic, social, or physical circumstances, can enjoy equal opportunities. Inclusion is not only a matter of social justice; it is also a key element in achieving lasting sustainability that protects the environment and improves the quality of life for all.

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Physical activity for the promotion of cognitive functions: The role of the exercise-induced Brain Derived Neurotrophic Factor in muscle-brain crosstalk

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Abstract
During physical activity, the contracting skeletal muscle acts as an endocrine organ for its ability to secrete molecules called myokines, mostly cytokines and growth factors, which modulate metabolic and cellular functions in different organs and tissues. Some of the most relevant for the brain include Brain-Derived Neurotrophic Factor, Insulin-like growth factor-1, Interleukin-6, Irisin, cathepsin B, and vascular endothelial growth factor, which are involved in muscle-brain crosstalk. Brain-Derived Neurotrophic Factor improves cognitive functions by neurogenesis, and the increase of plasticity in the hippocampus region. This review aims to provide recent insights on the role played by physical activity and diet in ameliorating cognitive functions, focusing on the effects involving Brain-Derived Neurotrophic Factor.

Keywords: Physical activity; cognitive functions; myokines; brain-derived neurotrophic factor (BDNF); muscle-brain crosstalk; neurodegenerative disorders.

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Introduction

In the last few decades, the recent and rapid progress in bio-medical research and socio-economic improvements have led to an increase in life expectancy which, however, has greatly increased dementia and

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neurodegenerative disorders, especially in the elderly population (Davis *et al.,* 2022). In addition, sedentary behaviors, which are characterized by a low energy expenditure (≤ 1.5 metabolic equivalents, METs) contribute to the risk factors linked to cognitive decline and dementia (Tremblay *et al.,* 2017). To prevent neurodegenerative disorders or reduce their harmful effects on cognitive functions in older adults, several non-pharmacological interventions, such as physical activity (PA), are used. Indeed, the regular practice of PA emerged as the most useful approach for positively influencing health, well-being, and enhancing cognitive functions in humans (Montesano *et al.,* 2013; Erickson *et al.,* 2019; Nazlieva *et al.,* 2019; Nasso *et al.,* 2024). For example, PA enables healthy older adults to improve their executive functions and memory, whereas only global cognition is improved in their peers with cognitive impairments (Sanders *et al*., 2019). The same finding was observed for several cognitive functions (Memory, executive functions, processing speed and global cognition) in sedentary older adults (Zhao *et al.,* 2022). At the macroscopic level, the beneficial effects of PA on cognitive functions are explained by neurogenesis, synaptogenesis, and angiogenesis (Lista and Sorrentino, 2010). The key molecular mechanisms underlying these macro-level changes that induce the beneficial effects of PA on cognitive functions involve myokines, including proteins and peptides secreted by contracting skeletal muscle, which acts as an endocrine organ (Iizuka *et al.,* 2014; Pedersen and Febbraio, 2012; Severinsen *et al.,* 2021). Myokines act in a hormone-like manner modulating metabolism and cellular functions in different organs (Severinsen *et al.,* 2021). Among these myokines, Brain-Derived Neurotrophic Factor (BDNF) exerts a pivotal role in improving cognitive functions. Furthermore, PA and/or an appropriate diet can reduce the age-related cognitive decline associated to neurodegenerative disorders, such as Alzheimer's disease (AD) and Parkinson's disease (PD) (Chieffi *et al.,* 2017; Miranda *et al.,* 2019). This review aims to provide recent insights on the role played by PA and diet in ameliorating cognitive functions, focusing in particular on the effects involving BDNF.

1. Myokines involved in muscle-brain crosstalk and cognitive improvement

Myokines are signaling molecules secreted by contracting skeletal myofibers (Iizuka *et al.,* 2014; Severinsen *et al.,* 2021). Up to now, about 1,110 myokines have been identified which can act in an autocrine, paracrine and endocrine manner modulating energy metabolism and plasticity of the

skeletal muscle cell, that includes hypertropia, hyperplasia and the repair process of damaged tissues (Lee *et al.,* 2019; Bortoluzzi *et al.,* 2006; Pedersen and Febbraio, 2012). Among these myokines, BDNF, Interleukin-6 (IL-6), Insulin-like Growth Factor-1 (IGF-1), irisin, Leukemia Inhibitory Factor (LIF) have been identified as mediators of brain neuroplasticity and cognitive functions (Miranda *et al.,* 2019; Pedersen, 2019; Vints *et al.,* 2023). However, BDNF is the major myokine involved in muscle-brain cross-talk whose expression level can be up-regulated PA and an appropriate diet, thus improving cognitive functions (Liu and Nusslock, 2018; Miranda *et al.,* 2019; Vints *et al.,* 2023).

2. BDNF and cognitive functions

2.1. BDNF structure and functions

BDNF is a 25-28 kDa homodimer protein, belonging to the neurotrophin family which also includes Nerve Growth Factor (NGF), Neurotrophin (NT) -3 and NT-4, structurally related members playing crucial roles in the survival and differentiation of neurons in the nervous system (Hernández *et al.,* 2024). BDNF is one of the major neurotrophins essential for neuron growth and survival; it is mostly involved in the synaptic plasticity which controls memory and learning processes (Liu and Nusslock, 2018; Miranda *et al.,* 2019). Mechanisms underlying cognitive enhancement exerted by exercise-induced BDNF include neurogenesis, increased synaptic plasticity which allows for better communication between neurons and neuroprotection during neurodegeneration process (Miranda *et al.,* 2019; Vints *et al.,* 2023).

2.2. BDNF expression, regulation and bio-signaling pathways

BDNF is synthetized by various cell types, and its expression and secretion are regulated in response to different factors, such as age, pathological conditions, PA (Brigadski and Leßmann, 2020). The alteration of BDNF concentration in tissue and serum is associated with neurodegenerative, neurological, or even cardiovascular diseases (Brigadski and Leßmann, 2020). In the central nervous system, BDNF is predominantly detected in the brain, particularly in the hippocampus, cerebral cortex, amygdala, striatum and hypothalamus (Edelmann *et al.,* 2014).
BDNF is expressed by nervous cell types such as glutamatergic neurons, astrocytes and microglia (Marie *et al.,* 2018). In non-neurogenic tissues,

BDNF is expressed in (Cefis *et al.,* 2020), heart, kidneys, submaxillary glands, ovaries, dorsal ganglia, lungs and skeletal muscle (Gass and Hellweg, 2010).

Like many hormones and growth factors, BDNF is synthetized as proBDNF precursor (32-35 kDa) (Koshimizu *et al.,* 2009) which is subsequently cleaved either intracellularly by serine proteases such as PC1/3 or furin, or extracellularly by plasmin and/or matrix metalloproteases (MMPs) to form mature protein (Matsumoto *et al*., 2019). ProBDNF and mature BDNFs show opposite effects interacting respectively with the p75 neurotrophin receptor (p75NTR) or Trk tyrosine kinase receptors; in fact, ProBDNF induces synaptic weakening, apoptosis and long-term depression whereas BDNF exerts vital functions (Koshimizu *et al.,* 2009). However, further research is needed to fully understand the proBDNF role and functions.

Mature BDNF binds to the low affinity receptor tyrosine kinase TrkB and to the p75 receptor with high affinity; the binding to TrkB stimulates the dimerization and phosphorylation of the receptor with activation of the intracellular tyrosine kinase domain that interacts with different intracellular targets such as MAP kinases and phosphatidyl-inositol 3 kinase (Sasi *et al.,* 2017).

Within the brain, BDNF receptor activation increases synaptic plasticity, the number of dendritic spines, and the release of the neurotransmitters glutamate, γ-aminobutyric acid (GABA), dopamine and serotonin (Leal *et al.,* 2014).

2.3. BDNF in neurodegenerative disorders

In neurodegenerative diseases, such as AD, PD and Huntington's disease, the cognitive impairment, including memory, thinking and judging skills, has been linked to the reduced expression of BDNF level (Narisawa-Saito, *et al.,* 1996; Hock, *et al.,* 2000; Zuccato, *et al.,* 2008). Alterations of BDNF expression have been described in the brain area responsible for memory processes, such as the hippocampus and parahippocampal, which are involved in psychiatric and neurodegenerative disorders (Miranda *et al.,* 2019). In AD disease, the decreased neurogenesis with impaired neuroplasticity leading to depression and memory loss have been correlated to a decrease in BDNF levels (Miranda, *et al.,* 2019).

3. Strategies targeting BDNF for the treatment of cognitive decline

Since a decrease in BDNF expression levels has been linked to the

cognitive decline observed in aging and neurodegenerative, neurological and psychiatric disorders (Miranda *et al.,* 2019), new strategies for cognitive improvement aimed at increasing BDNF expression level have been developed (Nicastri *et al.,* 2022). Here we highlight the major pharmacological or non-pharmacological approaches usefull to enhance BDNF levels.

3.1. Pharmacological strategies for improving cognitive functions

Up to now, many efforts have been employed to find pharmacological therapies for the treatment of AD which can also ameliorate cognitive functions and delay further progression. Cholinesterase inhibitors, which prevent the breakdown of acetylcholine, primarily used for the treatment of AD and PD, such as Donepezil, Galantamine and Rivastigmine can ameliorate the symptoms of the disease, however they only induce a modest improvement of cognitive function, exerting side-effects and without being able to revert the diseases (Miculas *et al.,* 2023). Glutamate antagonists such as memantine, a N-methyl-D-aspartate (NMDA) receptor antagonists, act by regulating glutamate activity and improving dopamine transmission; they can increase memory and attention but induce side-effects (Wesnes *et al.,* 2015).

However, considering low efficacy in memory improving and of side effects exerted by these drugs, several studies investigated alternative approaches focusing on the increase of BDNF exerted by PA and nutritional interventions.

3.2. Physical activity and BDNF

Many studies have investigated whether different types of PA could affect BDNF expression levels, by evaluating the effects of a single exercise (acute effects) or the regular practice of physical exercise (chronic effects) in humans. In studies analyzing the acute effects of PA on BDNF levels, it has been demonstrated that in men, 40 min of vigorous exercise increases circulating BDNF levels (Schmolesky *et al.,* 2013). This enhancement of BDNF levels was not associated to the type of exercise (aerobic or resistance) (Arazi *et al.,* 2021) or to the health status (healthy or with AD) in elderly adults (Coelho *et al.,* 2014). Apart from these results, several meta-analyses from studies aiming to evaluate the acute effect of PA on BDNF levels, have confirmed the increase of serum or plasma BDNF concentration (Dinoff *et al.,* 2017; Szuhany *et al.,* 2015). In addition, studies investigating the chronic effect of PA on BDNF levels, demonstrated that a one-year

aerobic intervention resulted in a growth of BDNF concentration which was correlated to an increase of volume in the right and left hippocampal regions (Erickson *et al.,* 2010). A six-month aerobic intervention (45 to 60 minutes, 4 times per week, 75% to 85% of heart rate reserve) showed an increase in BDNF in women with mild cognitive impairment (MCI) but not in their male peers (Baker *et al.,* 2010). The meta-analysis by Szuhany and colleagues confirms these results, highlighting the increase in plasma or serum BDNF concentration after a 3-week to 2-year aerobic program at an intensity of 50-80% of VO_2max (Szuhany *et al.,* 2015). The increase of BDNF concentration induced by PA involves the PGC-1α/FNDC5/BDNF signaling pathway (Wrann *et al.,* 2013). Taken together, these studies indicated that both acute and chronic effects exerted by PA up-regulated BDNF expression, and its circulating form at the peripheral level can cross the blood-brain barrier influencing brain specific regions involved in cognitive performance (Pan *et al.,* 1998).

3.3. Diet and BDNF

Among life-style interventions, diet plays a crucial role exerting beneficial effects on human health and brain functions modulating BDNF concentrations (Gravesteijn *et al.,* 2022). Evaluation of dietary patterns has revealed that the Mediterranean diet, characterized by high consumptions of vegetables, fruit, whole grains, nuts, fish and olive oil, has been associated to a reduced risk of cognitive decline and dementia (Arcone *et al*., 2023; Maiuolo *et al.,* 2023; D'Errico *et al.*, 2024), particularly through the increase of BDNF expression levels (Fu *et al.,* 2022; Tirani *et al*., 2024; Fekete *et al.,* 2025). The most effective dietary components of the Mediterranean diet include polyphenols, such as flavonoids (in grains, vegetables, fruit, olive oil, and beverages such as red wine, tea, chocolate, coffee) and other nutritional factors such as omega-3 fatty acids (fish, almonds, walnuts) (Román *et al.,* 2019; Ziaei *et al.,* 2024). Also, vitamins B6, B12, and folate are crucial for neurological functions because their deficiencies are associated with cognitive impairment and dementia (Agnew-Blais *et al*., 2015).

Diet polyphenols may induce BDNF upregulation through different mechanisms, which encompass their anti-oxidant and anti-inflammatory properties effect thus supporting BDNF-supporting neuronal survival (Grabska-Kobyłecka *et al.,* 2023). These effects are exerted by various bio signaling pathways, including the cAMP response element-binding protein (CREB) pathway, leading to enhanced BDNF transcription (Jalouli *et al.,* 2025).

Conclusion and future perspectives

In this review, we discuss the role of physical activity in promoting brain health, mostly increasing the production BDNF by contracting skeletal myofibers. BDNF acts enhancing plasticity, cognition, learning, and memory. BDNF behaves as a key regulator of neuroplasticity and cognitive functions, acting through complex bio signaling pathways which regulate energy metabolism and brain functions. The increase of BDNF expression during physical activity highlights its therapeutic potential for cognitive decline linked to aging and neurodegenerative disorders. In addition, the adoption of dietary pattern as the Mediterranean diet constitutes a promising strategy to enhance BDNF's benefits for brain function, and prevention of cognitive impairments.

These lifestyle interventions enhance BDNF expression level thus preventing, delaying cognitive decline and ameliorating learning and memory functions. Cognitive functions are fundamental to human behavior, learning, and adaptation, enabling individuals to apply knowledge, problem solving and intellectual development. The research in the neuroscience field demonstrated the role of brain regions, such as hippocampus, cerebral cortex, and neurotrophic factors, mostly the exercise-induced BDNF in the regulation of cognitive processes. Although further research is needed to better understand the relationship among PA, diet and BDNF expression, current evidence indicates that adopting healthy lifestyle certainly contributes to enhancing cognitive abilities and overall well-being.

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Dual Career Athletes and Sustainable Development: A Model for the Future of Sport

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Abstract
Dual career athletes play a crucial role in the sustainable development of sports and society. Balancing education, professional training, and athletic commitments fosters long-term career stability while enhancing social and economic inclusion. Effective dual career policies mitigate financial and psychological risks, equipping athletes with essential skills for post-sport careers. Investing in structured dual career frameworks benefits both individuals and the broader sports ecosystem, ensuring long-term viability and resilience. Collaboration among stakeholders is key to promoting sustainability and inclusion in sports through dual career opportunities.
Keywords: Sustainable Development; Athlete Transition; Economic Sustainability; Social Inclusion; Education and Sport; Career Opportunities.

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Introduction

In recent decades, the concept of dual careers for athletes has gained increasing relevance in the international sports landscape. Traditionally, high-level athletes have faced the dilemma of choosing between pursuing a competitive career and obtaining academic or professional training. However, economic, social, and cultural transformations have pushed toward a more sustainable model, enabling athletes to reconcile their sports careers with parallel educational and professional development (Stambulova & Wylleman, 2019). This strategy not only ensures a more secure future for athletes after retirement from competition but also contributes to creating a

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more balanced sports system aligned with sustainability principles (European Commission, 2012).

The concept of sustainable development, officially introduced by the Brundtland Report in 1987, is based on the idea of meeting present needs without compromising the ability of future generations to meet their own (Brundtland, 1987). In the sports sector, this principle translates into a model that considers not only environmental sustainability but also economic and social sustainability. In this perspective, the dual career emerges as a key strategy for ensuring the longevity of athletes' careers and reducing inequalities and vulnerabilities associated with the end of competitive activity (Aquilina, 2013).

The dual career refers to the ability of athletes to combine their sports commitment with an academic or professional path without having to completely sacrifice one of the two spheres. The European Union, through its 2012 Recommendation on the dual career of athletes, emphasized the importance of policies and programs aimed at supporting athletes in this challenge (European Commission, 2012). Educational institutions, sports organizations, and the labor market must collaborate to create favorable environments that allow athletes to develop transversal skills and prepare for a sustainable future (Henry, 2013).

The benefits of a dual career are manifold: economic security, as many athletes struggle to maintain an adequate standard of living after retirement, especially in disciplines with fewer earning opportunities; psychological well-being, as the awareness of having professional alternatives reduces the anxiety associated with post-career uncertainty; and societal contribution, as dual-career athletes can become ambassadors of positive values, such as resilience, time management, and discipline, contributing to a more balanced and sustainable society (Johansson & Lundqvist, 2024).

One of the crucial aspects of sustainable development in sports concerns its economic sustainability. Sports careers are often short-lived, making long-term economic planning essential. A dual career allows athletes to avoid exclusive dependence on income from sports and invest in their professional growth. Many dual career support programs include scholarships, academic tutoring, and flexible educational pathways to enable athletes to balance study and training (Frontini & Zibin, 2025). Universities and educational institutions are implementing personalized learning models, online courses, and tailored programs for professional athletes. These tools ensure that education is not an obstacle to a sports career but an added value. Furthermore, economic sustainability also extends to sports federations and clubs, which can benefit from athletes better prepared for managerial or leadership roles within the sports sector. Former athletes trained in sports

economics, management, or communication can contribute to the growth and professionalization of the entire sector, making it more resilient and innovative (Henry, 2013).

The dual career also represents an important tool for social sustainability, as it promotes inclusion and equal opportunities for all athletes, regardless of gender, sports discipline, or socio-economic conditions. Gender equality is a key element: historically, many female athletes have had fewer opportunities to earn high salaries than their male counterparts. The possibility of pursuing parallel education increases female athletes' economic autonomy and helps reduce the gender gap in sports. Additionally, the dual career is particularly relevant for athletes competing in less commercialized disciplines with fewer financial resources. Through support programs, these athletes can build an alternative career without prematurely abandoning sports. Athletes with an academic background can have a significant impact on society, both as mentors for younger generations and as promoters of ethical and sustainable values (Johansson & Lundqvist, 2024).

Although the link between a dual career and environmental sustainability may seem less immediate, there are several points of connection. Athletes who receive advanced education are more likely to develop awareness of environmental issues and promote sustainable sports practices. For example, athletes with training in environmental sciences, circular economy, or sustainable engineering can contribute to innovations in the sports world, such as designing eco-friendly equipment, managing sports facilities efficiently, or reducing the environmental impact of sporting events. Moreover, high-level athletes are often public figures with strong media influence. If educated on environmental issues, they can become ambassadors of sustainable practices, raising public awareness on topics such as carbon footprint reduction, recycling, and responsible resource use (Frontini & Zibin, 2025).

The dual career is not just an opportunity for athletes but a true model of sustainable development for sports and society. It ensures a more secure future for athletes, reduces social inequalities, promotes more responsible economic management, and contributes to the growth of environmental awareness within the sports world. For this model to be effectively implemented, a joint commitment from sports institutions, academia, and governments is necessary. Flexible education programs, economic incentives, and a culture that values athletes' dual paths are fundamental elements to creating a fairer, more resilient, and sustainable sports ecosystem. In an era where sustainability has become a global priority, the dual career represents a concrete pathway to ensuring that sports are not just

a source of entertainment but also a driver of social, economic, and environmental progress.

Economic Sustainability: Ensuring Financial Stability for Athlete

Economic sustainability in sports is a critical factor influencing the long-term financial well-being of athletes. Unlike many other professions that allow for a prolonged career with steady income growth, most athletes face relatively short careers, unpredictable earnings, and financial instability after retirement. Ensuring economic sustainability for athletes involves financial literacy, diversified career pathways, responsible sponsorship agreements, and governance policies that protect their financial interests (Andrews & Harrington, 2020). For dual career athletes – those who balance both sports and education or work – economic sustainability is even more complex, requiring structured support systems and policies that facilitate the coexistence of athletic and professional development (Aquilina, 2013).

One of the biggest challenges athletes face is the short duration of their professional careers. Research by Stambulova and Wylleman (2019) indicates that elite athletes often retire by their mid-30s, leaving them with several decades of life to manage financially without competitive sports income. For dual career athletes, the early development of a parallel professional career can provide long-term financial security and reduce dependence on sports income alone. The European Commission (2012) has issued guidelines advocating for structured dual-career programs, emphasizing their importance in preparing athletes for life beyond sports and ensuring economic resilience.

Financial literacy is another crucial component of economic sustainability, particularly for dual career athletes who must navigate both their sports-related earnings and their secondary professional income. Many athletes lack the necessary education on budgeting, investments, and wealth management, which can lead to poor financial decisions and even bankruptcy. According to Henriksen, Storm, and Ryom (2021), implementing financial literacy programs within sports organizations and educational institutions can significantly enhance athletes' ability to manage their earnings effectively. These programs should cover topics such as smart investing, retirement planning, and risk assessment to ensure long-term financial stability (Miller & Martin, 2022).

Dual career athletes must also strategically manage their sponsorship agreements and contractual earnings. High-profile athletes often secure lucrative endorsement deals, yet many fail to negotiate long-term financial

benefits. A study by Kellison and Hong (2022) suggests that athletes should work with financial advisors to secure contracts that provide stable financial returns beyond their active years. Moreover, sponsorship agreements should encourage responsible financial planning, helping athletes avoid reckless spending and invest in long-term assets (Smith, 2021). Dual career athletes have an advantage in that they can use their secondary careers as leverage in negotiations, ensuring financial stability beyond their sports tenure.

Governance bodies and sports organizations bear a critical responsibility in ensuring economic sustainability for dual career athletes. Policies such as flexible education programs, financial assistance for continued education, pension schemes, retirement funds, and post-career support programs can provide financial security. The International Olympic Committee (IOC) and national sports federations have initiated programs aimed at assisting athletes in their career transitions, but these initiatives must be expanded to cater to dual career athletes, who may require tailored support that acknowledges their dual commitments (IOC, 2020).

Investing in diversified financial opportunities is another way for dual career athletes to achieve economic sustainability. Given the irregular income structure of sports careers, investing in financial portfolios, real estate, or business ventures can provide a stable financial foundation. Financial institutions and advisory services should develop specialized investment plans tailored to the unique income structures of dual career athletes, ensuring passive income even after retirement (Thompson & Rogers, 2023). By leveraging their secondary careers, these athletes can build a financial cushion that sustains them beyond the duration of their sports careers.

Athletes who successfully transition into sustainable careers post-retirement serve as role models for financial responsibility. Many former athletes have leveraged their brands to become entrepreneurs, coaches, or commentators, demonstrating how to secure financial stability beyond their playing years. Mentorship programs where retired dual career athletes guide younger athletes on financial management and career planning can be instrumental in fostering economic sustainability within the sports community (Williams & Carter, 2021). Such programs not only help athletes plan for the future but also create a network of financially stable former athletes who contribute to society beyond their athletic achievements.

The integration of economic sustainability principles into sports governance requires collaboration between sports federations, governments, financial institutions, and educational bodies. Policies that mandate financial education, career transition support, and responsible sponsorship agreements can help build a financially resilient athletic community. Encouraging

research on athlete financial behavior and sustainable economic models is essential for developing innovative strategies that cater to the evolving landscape of professional sports (Brown, 2022). Dual career athletes, in particular, require policies that facilitate career flexibility, allowing them to make the most of both their sports careers and their professional endeavors.

In summary, economic sustainability is fundamental to an athlete's long-term financial security and overall well-being. For dual career athletes, balancing sports with education or employment can serve as a crucial financial safety net, reducing reliance on sports income and ensuring stability beyond retirement. By prioritizing financial literacy, career diversification, structured support systems, and responsible financial planning, athletes can mitigate the risks associated with short-term sports careers and build a sustainable financial future. Sports organizations and policymakers must recognize their role in fostering economic sustainability and implement strategies that empower athletes to secure their financial stability beyond their competitive years. Addressing these challenges through education, governance, and strategic planning will benefit not only individual athletes but also contribute to the broader economic sustainability of the sports industry.

Social Sustainability: Inclusion, Equality, and Career Opportunities

Social sustainability in sports is an essential pillar for ensuring long-term well-being, equity, and opportunities for athletes, particularly those pursuing dual careers. The dual career model, which allows athletes to balance sports participation with education or professional development, is increasingly recognized as a mechanism for promoting inclusion, equal opportunities, and long-term career security (Aquilina & Henry, 2013). By fostering a socially sustainable environment, sports organizations, educational institutions, and policymakers can contribute to a more inclusive and equitable system that supports athletes throughout and beyond their competitive careers. One of the primary concerns in social sustainability for dual career athletes is ensuring accessibility and inclusion for all athletes, regardless of gender, socioeconomic background, or disability status. Research has shown that athletes from disadvantaged backgrounds face significant barriers in accessing education and career opportunities while competing at elite levels (Capranica & Guidotti, 2016). Social sustainability strategies should aim to remove these barriers by providing scholarships, mentorship programs, and flexible educational pathways. For female athletes, balancing a dual career often presents unique challenges, including gender biases in sports and

workplace inequalities. According to Henry (2020), women in sports experience higher dropout rates due to limited professional opportunities and societal expectations. Addressing these disparities requires targeted policies, such as equal funding for male and female sports, maternity protections, and career transition programs that accommodate family responsibilities (European Commission, 2016). Similarly, athletes with disabilities face systemic barriers in accessing dual career opportunities. Inclusive educational and vocational programs are essential to ensuring that para-athletes have equitable access to career pathways beyond sports (Farì et al., 2023). Adaptive learning environments, employer incentives for hiring para-athletes, and mentorship initiatives can facilitate the transition from sports to professional careers (De Bosscher et al., 2021). Ensuring equality in the support structures available to dual career athletes is crucial for promoting social sustainability. Athletes from different socioeconomic backgrounds, sports disciplines, and regions often experience disparities in access to financial resources, training facilities, and educational support (Stambulova & Wylleman, 2019). Addressing these inequalities requires collaborative efforts from sports organizations, governments, and academic institutions. For instance, elite athletes in high-revenue sports such as soccer and basketball often receive more financial and structural support compared to those in less commercialized sports. This creates a gap in the ability of athletes to pursue dual careers successfully (Guidotti et al., 2015). Policymakers must ensure that funding mechanisms are equitably distributed across different sports and athlete groups to provide equal opportunities for career development. Additionally, access to dual career programs should not be limited to athletes in developed nations. Many athletes from low- and middle-income countries lack the institutional support needed to pursue education alongside their sports careers. International collaboration between sports federations and universities can facilitate exchange programs, remote learning options, and international mentorship networks to bridge this gap (Ryba et al., 2017). A fundamental aspect of social sustainability is ensuring that athletes can transition smoothly from sports into meaningful careers. Many athletes struggle with post-retirement identity crises, financial instability, and difficulty integrating into the job market due to a lack of professional experience outside of sports (Torregrossa et al., 2020). Dual career programs that integrate career counseling, internships, and academic qualifications play a vital role in preventing these challenges. One effective strategy is the development of partnerships between sports organizations and businesses to provide athletes with tailored career pathways. For example, initiatives such as the IOC's Athlete365 Career+ program offer career transition support, networking opportunities, and job placements for retiring

athletes (International Olympic Committee, 2021). Expanding such programs to a broader range of sports and geographical regions can enhance their impact. Entrepreneurship is another viable career pathway for dual career athletes. Many athletes develop leadership, teamwork, and resilience skills through sports, which are valuable in business ventures. Governments and financial institutions can support athlete entrepreneurs by offering specialized training, startup grants, and networking platforms to facilitate their transition into business (Kelly & Hickey, 2018). To ensure that dual career athletes benefit from a socially sustainable system, policymakers must adopt holistic and inclusive approaches. The following policy recommendations can enhance social sustainability in dual career pathways: Flexible Education Models – Universities and vocational institutions should implement tailored academic programs that accommodate the demanding schedules of athletes, including online learning, part-time courses, and mentorship programs. Workplace Inclusion Policies – Employers should be encouraged to create flexible work arrangements, mentorship initiatives, and career development programs specifically for athletes transitioning from sports to professional careers. Equitable Funding Allocation – Sports governing bodies must ensure that financial and structural support is equitably distributed across all athletes, regardless of gender, sport type, or socioeconomic background. Career Transition Support – Governments and sports organizations should establish structured career transition programs that provide financial counseling, networking opportunities, and employment assistance for retiring athletes. International Collaboration – Cross-border partnerships between educational institutions, businesses, and sports federations can create exchange programs and career development initiatives that benefit athletes from diverse backgrounds. Social sustainability in dual career pathways is essential for fostering inclusion, equality, and long-term career opportunities for athletes. By implementing equitable support structures, removing barriers to education and employment, and fostering career development initiatives, stakeholders in sports, education, and policy can ensure that athletes have sustainable career trajectories beyond their competitive years. A socially sustainable dual career model benefits not only individual athletes but also contributes to broader societal goals of inclusion, workforce diversity, and economic stability.

Environmental Sustainability: Athletes as Agents of Change

Environmental sustainability has become a crucial aspect of global policy

discussions, and the role of athletes, particularly dual career athletes, in promoting sustainable practices is gaining increasing attention. Dual career athletes, who balance both sports and education or professional careers, possess unique platforms to influence and advocate for environmental sustainability. As role models with extensive social reach, these athletes have the potential to educate the public, engage in sustainable initiatives, and promote eco-friendly behaviors within and beyond the sports industry. Their dual expertise in both athletic and professional or academic fields makes them well-positioned to act as agents of change, integrating sustainable practices into sports and society as a whole (McCullough & Kellison, 2020).

One of the most significant ways in which dual career athletes contribute to environmental sustainability is through their advocacy and influence on public awareness. Athletes often have large followings on social media and in public engagements, allowing them to reach diverse audiences and promote eco-friendly behaviors. Their engagement in sustainability campaigns, such as reducing plastic waste, promoting renewable energy, and supporting climate action initiatives, enhances the visibility and credibility of environmental movements (Trendafilova et al., 2021). Many athletes have actively endorsed sustainable brands, collaborated with environmental organizations, and participated in educational programs to spread awareness. This engagement is particularly impactful when athletes draw connections between sustainability and their own sports, highlighting how climate change and environmental degradation directly affect training conditions, competitions, and overall athlete well-being.

The dual career framework equips athletes with academic and professional expertise, allowing them to integrate sustainability into various sectors beyond sports. Many dual career athletes pursue studies or careers in fields such as environmental science, business, and public policy, where they can implement sustainability strategies within their professional domains. Research by Casper et al. (2022) indicates that athletes engaged in dual careers often leverage their education to develop sustainable sports practices, such as eco-friendly event management, sustainable facility designs, and responsible waste management. Their interdisciplinary knowledge enables them to bridge the gap between sports organizations and environmental policy-making, advocating for sustainable regulations within sports federations and beyond.

Sports organizations and governing bodies are increasingly recognizing the need to incorporate sustainability into their operations, and dual career athletes play a crucial role in driving these changes. Sustainable event management, which includes minimizing carbon footprints, reducing waste, and promoting green transportation options, is a growing area where athletes

can exert influence (Dingle & Mallen, 2020). Athletes involved in dual careers often take on leadership roles within their respective organizations, pushing for sustainable policies such as the use of recycled materials for uniforms, energy-efficient stadiums, and climate-neutral competitions. The International Olympic Committee (IOC) and other major sports governing bodies have launched sustainability programs that encourage athletes to participate in green initiatives, demonstrating the importance of athlete-led environmental advocacy (IOC, 2021).

One of the pressing environmental issues within sports is the impact of travel-related carbon emissions. International competitions require extensive travel, contributing to significant greenhouse gas emissions. Dual career athletes, particularly those with a background in environmental sciences or business, have been instrumental in advocating for sustainable travel policies. This includes supporting carbon offset programs, promoting regional competitions to reduce long-haul flights, and encouraging the use of high-speed rail or electric transportation when possible (Pope et al., 2022). By leveraging their platforms and expertise, these athletes contribute to reshaping the way sports organizations address climate impact, promoting policies that align with broader environmental goals.

Sustainable practices within sports training and facilities are another area where dual career athletes act as catalysts for change. Many athletes have championed initiatives such as solar-powered training centers, water conservation measures in sports complexes, and eco-friendly equipment manufacturing. For instance, innovations in biodegradable sportswear and recycled materials in sports infrastructure are being driven, in part, by athletes who advocate for greener alternatives (Murray & Dwyer, 2021). As both competitors and professionals, dual career athletes bring firsthand insight into how sustainable practices can be seamlessly integrated into the daily operations of training environments.

The intersection between sustainability and athlete well-being is another critical consideration. Climate change has direct implications for sports performance, as rising temperatures, extreme weather conditions, and environmental pollution can negatively affect training and competition conditions. Studies have shown that athletes exposed to high levels of air pollution experience reduced respiratory efficiency, increased risk of heat-related illnesses, and overall decreased performance levels (Orr & Inoue, 2020). As a result, many dual career athletes are advocating for policies that address environmental concerns in sports, such as improved air quality monitoring, climate adaptation strategies for outdoor sports, and sustainable hydration practices. Their unique position as both athletes and professionals enables them to engage in policy discussions, collaborate with environmental

researchers, and influence decision-making processes that prioritize both ecological and athlete health concerns (Raiola et al., 2015).

Educational institutions and sports academies are essential stakeholders in fostering environmental awareness among dual career athletes. Many universities and training centers have incorporated sustainability modules into their sports management and athlete development programs, providing athletes with the knowledge and skills needed to advocate for and implement sustainable practices (Babiak & Trendafilova, 2021). By equipping dual career athletes with education on climate change, ecological conservation, and sustainable business strategies, these institutions play a fundamental role in shaping the next generation of environmentally conscious athletes.

Corporate sponsorships also present opportunities for promoting sustainability through athlete engagement. Many companies that sponsor athletes are increasingly aligning their branding with environmental responsibility. Athletes who pursue dual careers in business or marketing can work with corporate sponsors to promote sustainable products, develop green business models, and support environmental initiatives (Sartore-Baldwin & McCullough, 2021). Sustainable sponsorship agreements can include commitments to reducing environmental impact, such as using eco-friendly materials in merchandise, offsetting carbon emissions from promotional events, and ensuring ethical supply chain practices. As brand ambassadors, athletes have significant influence over consumer behavior, making them valuable advocates for corporate sustainability efforts.

Community engagement is another crucial aspect of environmental sustainability where dual career athletes play an active role. Many athletes participate in grassroots initiatives, such as tree-planting campaigns, sustainable sports programs for youth, and environmental clean-up events. These efforts not only contribute directly to ecological conservation but also inspire younger generations to adopt sustainable practices in their daily lives (Farì et al., 2021; Mallen et al., 2022). By leveraging their public visibility and professional expertise, dual career athletes foster a culture of sustainability that extends beyond the sports industry into broader societal frameworks.

In conclusion, dual career athletes are uniquely positioned to serve as agents of change in the movement toward environmental sustainability. Their ability to balance sports with education and professional careers enables them to integrate sustainability principles into multiple sectors, including sports management, policy-making, corporate sponsorships, and community engagement. By advocating for eco-friendly practices, promoting sustainable event management, and influencing policy reforms, these athletes contribute to the long-term viability of both sports and the

environment. Moving forward, fostering sustainability education and creating opportunities for athlete-led environmental initiatives will be key to ensuring that sports continue to play a constructive role in addressing global environmental challenges.

Challenges and Opportunities in Implementing Dual Career Policies

The implementation of dual career policies presents both significant challenges and opportunities in the evolving landscape of modern sports and professional development. Dual career policies aim to support athletes in balancing their sporting commitments with education or vocational training, ensuring long-term career sustainability. While these policies have been widely recognized as essential for athlete welfare, their practical implementation varies across nations, sports disciplines, and educational systems, creating disparities in access and effectiveness (Stambulova & Wylleman, 2019). Understanding the key obstacles and potential benefits of dual career policies is crucial for developing comprehensive strategies that address the needs of athletes while fostering sustainable career transitions.

One of the primary challenges in implementing dual career policies is the structural and logistical constraints that athletes face. High-performance sports demand intensive training schedules, frequent travel for competitions, and psychological pressure, which often clash with academic or professional commitments. Many athletes struggle to find educational institutions or employers that offer the necessary flexibility to accommodate their sports careers. According to Capranica and Guidotti (2021), only a limited number of universities and training centers have structured programs that cater specifically to elite athletes, leading to disparities in dual career opportunities. The lack of tailored academic schedules, remote learning options, and athlete-friendly employment policies restricts many athletes from effectively managing their dual career aspirations.

Financial concerns also play a significant role in shaping dual career policies. Pursuing both an athletic and a professional career often requires additional financial resources, which may not be readily available to all athletes. Many emerging athletes face economic insecurity, as sports scholarships, sponsorship deals, and funding opportunities are not always sufficient to cover both education and training expenses. National policies vary widely in terms of financial support for dual career athletes, with some governments and sports organizations providing grants and scholarships, while others lack structured financial aid programs. Research by Henry

(2020) highlights that financial burdens often force athletes to prioritize short-term athletic success over long-term career planning, which can lead to post-retirement economic instability.

Cultural and institutional differences further complicate the successful implementation of dual career policies. In some countries, there is strong institutional support for combining sports and education, with government policies ensuring structured pathways for dual career athletes. However, in other regions, traditional education systems remain rigid, failing to accommodate the needs of athletes. The level of support provided by sports federations, educational institutions, and employers also varies, influencing the overall effectiveness of dual career policies. Research by De Bosscher et al. (2022) emphasizes the importance of fostering a dual career culture that values both academic and athletic success, reducing stigmatization of athletes who choose to pursue education alongside their sports careers.

Despite these challenges, implementing dual career policies offers numerous opportunities for athletes, educational institutions, and sports organizations. One of the primary benefits is the enhancement of athlete well-being and long-term career security. Athletes who pursue dual careers are better equipped to transition into post-sport professions, reducing the risk of unemployment and psychological distress after retirement. Studies by Aquilina (2013) have shown that athletes who engage in dual career pathways experience increased life satisfaction, better financial stability, and improved mental health outcomes compared to those who solely focus on sports.

Another opportunity lies in leveraging technology and innovative learning methods to support dual career athletes. The rise of online education, flexible learning platforms, and hybrid training models has enabled athletes to access academic and professional development opportunities without compromising their sports performance. Universities and training institutions that integrate digital learning strategies into their programs can significantly enhance accessibility for athletes, enabling them to manage their studies alongside rigorous training schedules. Digital advancements in career counseling, virtual internships, and remote mentorship programs further provide athletes with the resources needed to build sustainable post-sport careers (Ryom et al., 2021).

Collaborative efforts between sports organizations, academic institutions, and policymakers can also enhance the effectiveness of dual career policies. Multi-stakeholder partnerships can facilitate the development of structured dual career programs, offering academic flexibility, career counseling, financial aid, and mentorship opportunities for athletes. The European Commission (2012) has highlighted successful models in which universities,

employers, and sports federations work together to create environments that support athletes in their dual career journeys. Establishing best practices from these models and implementing them on a broader scale can enhance the accessibility and efficiency of dual career policies globally.

Furthermore, dual career policies contribute to the broader goal of sustainability in sports by promoting athlete development beyond their competitive years. Ensuring that athletes have viable career options post-retirement fosters financial independence and reduces the risk of financial hardship. This long-term approach aligns with the principles of economic sustainability, creating a more stable and resilient sports ecosystem. According to Brown et al. (2023), investing in dual career programs can lead to a more well-rounded athlete workforce, where former athletes transition into roles such as coaching, sports management, and entrepreneurship, contributing to the overall growth and innovation within the sports industry.

In other words, while challenges such as structural limitations, financial constraints, and cultural differences pose significant barriers to the implementation of dual career policies, the opportunities they present outweigh these difficulties. Advancements in digital education, collaborative policy-making, and increased awareness of athlete welfare have paved the way for more effective dual career frameworks. Moving forward, a commitment to enhancing accessibility, financial support, and institutional flexibility will be crucial in ensuring that athletes can successfully navigate both their sporting and professional aspirations. A holistic approach that integrates education, governance, and stakeholder collaboration will be essential in developing sustainable dual career policies that benefit both athletes and society as a whole.

Conclusions

The concept of dual career athletes and their role in sustainable development is gaining increasing recognition in both academic and policy discussions. As sports continue to professionalize and the demands on athletes grow, ensuring that they have viable career opportunities beyond their athletic endeavors is essential. Sustainability in sports must encompass not only economic and environmental dimensions but also social aspects, ensuring that athletes can transition successfully into post-sport careers while contributing positively to society. The integration of education and professional training alongside sports careers is a crucial element in achieving this goal.

A well-structured dual career framework benefits athletes by providing them with long-term security, reducing the psychological and financial risks associated with career transitions. When supported effectively, dual career athletes develop valuable competencies such as time management, adaptability, and leadership, which serve them well beyond their sports careers. Additionally, fostering dual career pathways contributes to broader societal sustainability by ensuring that the investment in athletes extends beyond their competitive years, promoting their engagement in various professional sectors where their skills and experiences can be highly valuable.

To ensure a sustainable future for dual career athletes, sports organizations, educational institutions, and policymakers must collaborate to establish clear and accessible dual career pathways. This includes providing flexible education programs, financial support, career guidance, and mental health resources tailored to the needs of athletes. Leveraging digital learning platforms and workplace integration initiatives can further enhance the accessibility of dual career opportunities.

In conclusion, dual career athletes represent a model for sustainable development in sports and society. Their ability to balance professional and athletic commitments showcases a pathway toward a more resilient and inclusive sports system. By investing in dual career policies, we not only secure the future of individual athletes but also strengthen the long-term viability of sports as a socially and economically sustainable sector. Ensuring continued support and innovation in dual career frameworks will be vital in shaping the future of sports and its broader societal impact.

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Competing Futures: Reconfiguring Sustainability in US Education Policy from Equity to Meritocracy

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Abstract

This study examines how inclusion is discursively constructed in sustainability-oriented educational policies through a linguistic analysis of six Executive Orders issued by former President Biden during his 2021-2025 administration, and by Donald Trump during the first month of his current presidency, January 2025. Drawing upon a critical discourse perspective and employing the tools provided by Systemic Functional Linguistics, we explore representations of diversity, equity and inclusion (DEI) in order to assess how vulnerability, participation, and exclusion are linguistically framed in the field of education. The findings will contribute to understanding how institutional discourse shapes inclusive education and sustainability, informing strategies for future equitable learning environments.
Keywords: DEI, Sustainability, Educational Policy, Transitivity analysis, Appraisal.

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1. Introduction

Education is a fundamental pillar of society, shaping economic growth, social cohesion, and democratic participation. Educational policies are never created in isolation but are deeply influenced by political ideologies, historical legacies, and social agendas. Governments exploit educational frameworks to promote dominant national narratives and societal values.

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Shifts in political leadership therefore often bring about substantial changes to educational priorities and curriculum design.

In recent decades, the concept of sustainability in education has extended beyond environmental concerns to encompass institutional inclusivity, together with equitable and just access for all. Sustainability feeds into Diversity, Equity, and Inclusion (DEI) policies (Gewirtz, 2001; Ball, 2012) which aim to create long-term systemic stability and fair representation for historically underrepresented groups. This holistic and future-oriented nexus is not always immediately evident as some policy frameworks in the United States and elsewhere do view sustainability as the expansion of inclusivity and systemic reform, while others tend to perceive it as a means of maintaining traditional structures and removing perceived ideological distortions.

The objective of this research is to examine how differing political perspectives shape the sustainability-DEI connection within education policy (Apple, 2004). The study focuses on the United States, a country where education policy has historically been a highly contested political space, often reflecting broader national debates over identity, equity, and governance. The two presidencies under examination, Joseph R. Biden (2021-2025) and Donald J. Trump (2025-present day), represent stark ideological contrasts in their approaches to DEI and sustainability in education. This sharp divergence provides a unique lens through which to analyse the shifting conceptualisation of sustainability in educational policies.

Whereas one of the aims of Biden's administration was to integrate DEI principles into federal policies in order to address systemic inequities, Trump's administration has worked to dismantle these frameworks in favour of merit-based governance and nationalistic educational models. The legislative mechanism adopted by both presidents to implement and uphold their widely divergent DEI measures is the constitutional tool exclusively adopted by US presidents: the Executive Order (EO). Functioning as official directives, EOs are issued by the President of the United States to manage operations within the federal government. Although they do not require congressional approval, they carry the force of law and can significantly shape policy directions, particularly in areas like education. EOs are legally binding on the executive branch but, unlike Congress, they do not create new legislation (Mayer, 2001). These provisions have been used extensively for policy shifts, including, over the years, civil rights, environmental regulations, and immigration policies.

This study analyses six EOs, three issued by Biden and three by Trump, that directly impact educational governance through DEI and sustainability-

related policies. Comprising our dataset, these EOs illustrate two contrasting visions of sustainability in education: one focused on structural inclusivity, the other centred on institutional continuity through the elimination of DEI frameworks.

1.1 Theoretical Foundations: Bourdieu's Capital and Educational Sustainability

Drawing upon Bourdieu's theories of capital (Bourdieu, 1986, 1990), contemporary US political debates, and global policy trends, this study locates DEI policies within a wider ideological debate over access to opportunity, categories of privilege and the purpose of education itself. Whether conceived as a structural necessity for long-term institutional stability or as an ideological disruption to traditional educational values, sustainability in education remains an ever-changing and strongly contested space, reflecting the shifting power dynamics of contemporary governance. Pierre Bourdieu's theory of capital offers a sociological outlook on inequality, institutional structures, and power dynamics within education. According to Bourdieu, access to opportunity is shaped by three primary forms of capital, each playing a crucial role in determining an individual's educational trajectory. Economic capital, which consists of material resources and wealth, directly influences the ability to access quality education and academic advancement. Cultural capital, encompassing knowledge, skills, and institutional credentials, holds significant value in society, as it determines an individual's ability to navigate and succeed within educational systems (Lareau, 2003; Reay, 2004). Finally, social capital, derived from networks and connections, reinforces systemic privilege by providing individuals with access to exclusive opportunities and resources that are not equally distributed across social groups. These forms of capital interact to reproduce social hierarchies by means of which educational advantages are often the result of generational inheritance rather than being equally accessible to all.

Bourdieu's framework is particularly relevant when analysing how DEI measures function as an integral part of sustainability narratives, thereby seeking to redistribute cultural and social capital, and ensuring that historically excluded groups gain access to the institutional mechanisms that grant both power and legitimacy. Resistance to such measures often framed as preserving neutrality or meritocracy can be seen as an attempt to protect the reach of dominant groups over educational capital, maintaining traditional hierarchies (Bourdieu and Passeron, 1977).

This theoretical approach also aligns with European Union (EU) legislation, where sustainability in education is linked to social inclusion and equity-driven policy reforms. The EU's Education and Training 2020 Framework[1], explicitly integrates Bourdieu's concept of social capital, highlighting the need for policies that reduce social stratification and foster economic mobility. Albeit the US lacks a centralised educational governance model similar to the one present in the EU, the contrasting narratives on sustainability and DEI reflect broader global debates regarding education as a lever of social reproduction or social transformation.

The contemporary political divide over DEI and sustainability in education is rooted in broader historical debates over race, class, and access to opportunity and privilege in the US education system. In the mid-20th century, the civil rights movements led to landmark policies such as affirmative action and federally enforced desegregation, in an attempt to redress historical inequalities in education and employment (Orfield, 2001; Ladson-Billings, 2006). Over the years, these policies have been increasingly contested, with critics arguing that they introduce new forms of discrimination by prioritising group identity over individual merit.

More recently, polarisation in US political discourse has moulded educational policies, particularly regarding the role of the federal government in ensuring equity and inclusion. Indeed, on March 20th, as this study goes to press, President Trump signed Executive Order 14151 directing the dismantling of the Federal Department of Education (Samuels, 2025). Whereas Biden's DEI policies were conceived as core components of educational and workforce sustainability, Trump's recent administration has framed such policies as antithetical to meritocracy and economic efficiency.

In light of the numerous and diverse aspects that characterise this study, research will be carried out on the basis of the following questions:

1) To what extent do linguistic choices in policy discourse, analysed using the tools provided by Critical Discourse Studies and Systemic Functional Linguistics, reflect broader ideological and political shifts in the framing of sustainability and educational governance?
2) How do US Executive Orders issued by the Biden and Trump administrations discursively construct sustainability in education, and what role does DEI play in shaping these constructions?
3) Can sustainability in education be considered a politically and ideologically malleable concept, subject to reinterpretation based on

[1] European Commission: Directorate-General for Education, Youth, Sport and Culture, ECORYS and SportsEconAustria, Education and training 2020 – Highlights from the ET 2020 Working Groups 2018-2020, Publications Office, 2021.

shifting power structures, historical legacies, and competing visions of equity and meritocracy?

2. Dataset

The dataset for this study comprises six EOs promulgated by two US administrations, those of President Joseph R. Biden (2021-2025) and President Donald J. Trump (2025-present day). These EOs serve as legally binding policy instruments that reflect the ideological stance and policy priorities of each administration, particularly in relation to sustainability in education and DEI initiatives. The dataset includes three EOs from each administration:

Biden Administration Executive Orders:[2]

1. Executive Order 14031 (May 2021). Focuses on advancing equity for Asian American, Native Hawaiian, and Pacific Islander (AANHPI) communities, emphasising inclusivity in federal education policies and workforce representation.
2. Executive Order 14035 (June 2021). Establishes diversity, equity, inclusion, and accessibility (DEIA) policies within the federal workforce, reinforcing DEI as a foundational principle for sustainable and inclusive governance.
3. Executive Order 14041 (September 2021). Strengthens federal support for Historically Black Colleges and Universities (HBCUs), positioning them as key institutions for economic and educational sustainability.

Trump Administration Executive Orders:[3]

1. Executive Order 14151 (January 2025). Ends federal DEI programs, dismantling previous efforts to institutionalize diversity-based policies in education and workforce sectors.
2. Executive Order 14173 (January 2025). Eliminates DEI-based preferences in hiring and education, framing meritocracy as the primary means of ensuring fairness and sustainability.
3. Executive Order 14190 (January 2025). Targets DEI in K-12 curricula, prohibiting perceived ideological indoctrination and reinstating a nationalist educational framework.

[2] https://www.federalregister.gov/presidential-documents/executive-orders.
[3] https://www.federalregister.gov/presidential-documents/executive-orders.

This dataset allows for a comparative discourse analysis that is both linguistically and politically significant. By examining how each administration's EOs frame sustainability, DEI, and educational governance, we aim to contribute to a deeper understanding of how language in policymaking reflects and reinforces broader ideological debates. The dataset thus serves as a critical resource for analysing the evolving discourse on sustainability in education within the US policy landscape.

3. Methodology

This study adopts a Systemic Functional Linguistics (SFL) approach, integrating Transitivity and Appraisal analysis to investigate the linguistic and ideological construction of sustainability and DEI policies in US EOs. The framework is particularly well-suited for uncovering power relations, ideological positioning, and rhetorical strategies within policy documents, allowing for an in-depth exploration of how language is used to frame, legitimise, or contest policy decisions. Developed by Halliday (1985), SFL is a linguistic theory that focuses on how language is structured to serve different communicative functions. SFL serves this study well because it enables a systematic and detailed analysis of linguistic structures in EOs, revealing how policy language constructs authority, inclusion, and exclusion.

Within SFL, Transitivity analysis (Halliday & Matthiessen, 2014) examines how processes, participants, and circumstances are represented in discourse. It identifies who acts, who is affected, and how actions are framed, making it an essential tool for analysing government policy documents that shape social structures.

Transitivity analysis distinguishes six main process types: material processes (action verbs) highlight who is responsible for change in a policy framework; mental processes (cognition, perception) reveal how policies interpret social realities; verbal processes (speech acts) indicate who has authority in decision-making; relational processes (being, attributing) define how concepts such as DEI and sustainability are categorised; existential processes (statements of existence) assert the legitimacy or presence of policy concerns; behavioural processes (human actions and reactions) illustrate how policy measures are enacted or resisted. By applying Transitivity analysis, this study identifies how agency and responsibility are assigned in Biden and Trump's EOs, determining whether DEI and sustainability are framed as active government interventions, passive obligations, or ideological burdens.

The second framework employed is Appraisal analysis, developed within SFL (Martin and White, 2005). It examines how evaluation, stance, and alignment are encoded in discourse. This is particularly relevant for understanding how policy documents use persuasive and ideological language to frame issues such as DEI and sustainability. Appraisal consists of three key dimensions: attitude examines how emotions, judgments, and values are expressed in policy language (e.g., framing DEI as a "moral responsibility" vs. a "radical agenda"); engagement analyses whether discourse is monoglossic (authoritative, presenting one view as fact) or heteroglossic (acknowledging alternative viewpoints); graduation identifies the intensity and amplification of language, revealing how strongly policies emphasise their positions.

This combined methodological approach is grounded in Critical Discourse Studies (CDS) and therefore particularly useful for this research for several reasons. Adopting a critical stance allows us to move beyond superficial descriptions of policy language and instead investigate how discourse constructs social realities, reinforces dominant ideologies, and influences public perception. By situating our analysis within a CDS framework, we critically examine how linguistic choices in policy texts serve to justify, challenge, or obscure specific political agendas, revealing the deeper sociopolitical implications of educational governance.

4. Analysis and Findings

The following section analyses the discursive construction of sustainability and DEI in education within EOs issued by the Biden and Trump administrations. As previously stated, this analysis reflects a CDS perspective, specifically focusing on Transitivity and the Appraisal framework, to examine how the language of educational policies encodes power, agency, and ideological positioning.

After a close reading of the EOs, carried out individually by the two authors in order to ensure inter-rater reliability (Armstrong et al., 1997), key themes pertaining to the selected EOs were identified and agreed upon, thereby providing a comparative outlook upon how each administration frames educational governance, sustainability, and DEI. In support of these thematic strands, transitivity and appraisal analyses were carried out so as to provide the necessary linguistic evidence to highlight the ideological contrasts embedded in policy discourse. The analysis is structured to first examine the EOs issued by the Biden administration, followed by those issued under the second Trump presidency, ensuring a clear and

comprehensive exploration of the competing conceptualisations of sustainability in education. For the purpose of clarity and ease of identification, the linguistic evidence deriving from both the Transitivity and the Appraisal analyses is underlined in the original quotation and further explained in the parentheses that follow.

4.1 Executive Orders under Biden

As can be seen in the analysis that follows, the Biden administration appears to have framed DEI as a key principle within educational governance, embedding it within broader sustainability initiatives through systemic interventions that, in all likelihood, aim to ensure equitable resource allocation, institutional support, and workforce inclusivity. The three recurring themes that strengthen the nexus between DEI and sustainable educational practices in Biden's EOs are the following:

1. Institutional Commitment to DEI as a Pathway to Educational Sustainability
2. Structural Reform and Federal Responsibility in Advancing Equity
3. Economic and Workforce Development Through Inclusive Educational Policies

4.1.1 Transitivity analysis

Each thematic strand, numbered 1, 2 and 3, is substantiated by linguistic evidence obtained from transitivity analysis as can be seen in the examples that follow.

1. Institutional commitment to DEI as a pathway to educational sustainability.
   "The federal government shall <u>expand</u> access to resources for institutions that serve underrepresented communities" (material process expanding access positions the government as an active agent in fostering DEI);
   "Agencies must <u>ensure</u> that hiring practices reflect the full diversity of the nation" (material process ensuring institutional accountability in equitable hiring).

2. Structural reform and federal responsibility in advancing equity.

"We recognize systemic barriers that hinder equitable educational access" (mental process acknowledging systemic inequalities as a first step toward reform);
"Programs will be redesigned to increase participation among historically underrepresented groups" (material process active restructuring of policy frameworks).

3. Economic and workforce development through inclusive educational policies.
"Investment in HBCUs ensures a sustainable and diverse workforce" (relational process framing sustainability as an economic and educational imperative);
"Colleges and universities play a vital role in the country's long-term prosperity" (relational process attributing national sustainability to educational institutions).

4.1.2 Appraisal analysis

The following examples under each of the three strands demonstrate how Biden's EOs would seem to reinforce DEI as a moral, economic, and social necessity:

1. Institutional commitment to DEI as a pathway to educational sustainability.
"Ensuring that all communities have access to quality education is essential to our nation's progress" (attitude: positive evaluation of inclusivity as a national imperative);
"Strengthening institutional partnerships fosters a more equitable society" (graduation: intensified language reinforcing systemic change).

2. Structural reform and federal responsibility in advancing equity.
"Federal agencies must take decisive action to eliminate inequities" (engagement: monoglossic stance that positions equity as non-negotiable);
"This administration remains unwavering in its commitment to education for all" (graduation: reinforced intensity of commitment to DEI).

3. Economic and workforce development through inclusive educational policies.
"Equity-driven policies promote long-term economic resilience" (attitude: explicit connection between DEI and national sustainability);

"A diverse workforce is not only a moral obligation but a strategic advantage" (engagement: alignment of ethical and economic arguments in favour of DEI).

The linguistic and discursive patterns identified in Biden's three EOs seem to illustrate how DEI is framed as an essential mechanism for educational sustainability. The recurring themes of institutional commitment, structural reform, and workforce inclusivity appear to reflect an underlying policy logic that brings together sustainable national development, equitable educational access, and participation. Through transitivity analysis, we have observed that agency is consistently assigned to federal institutions, reinforcing the notion that active government intervention is required. The policies outline education as a transformative force, capable of addressing systemic disparities through policy restructuring, funding allocation, and institutional accountability. The appraisal analysis would appear to further highlight the ideological positioning of DEI as a national priority, where inclusivity is framed not only as a moral obligation but also as an economic and strategic need. The use of graduation and engagement markers serves to strengthen the seemingly imperative tone of these policies, presenting educational equity as non-negotiable in sustaining long-term institutional resilience. These EOs suggest a vision of sustainability that transcends environmental concerns, embedding educational inclusivity as a mainstay of national progress. According to this representation, sustainability would appear to transcend the static preservation of institutions, thus ensuring that they meet the needs of an increasingly diverse and interconnected society. This framing stands in direct contrast to meritocratic, eliminative approaches, positioning equitable access to education as a prerequisite for economic and social stability.

4.2 Executive Orders under Trump

The Trump administration's EOs on education and DEI would seem to reflect a rather different ideological stance compared to those implemented under the Biden administration. These policies do not embed DEI as a structural pillar of sustainability, but instead prefer to represent it as the preservation of meritocratic principles, economic efficiency, and national stability.

The EOs issued under Trump put sustainability into effect through exclusionary rather than inclusionary mechanisms. Following the same procedure adopted previously, the linguistic analysis of these policies reveals

three recurring themes that illustrate the ideological disconnection between DEI and sustainability:

1. Sustainability as the Preservation of Meritocracy and Individualism.
2. The Rejection of DEI as an Unsustainable and Ideologically Driven Agenda.
3. Education as a Mechanism for National Identity and Economic Efficiency.

4.2.1 Transitivity analysis

As previously, each thematic strand, numbered 1, 2 and 3, is substantiated by linguistic evidence obtained from transitivity analysis as can be seen in the examples that follow.

1. Sustainability as the preservation of meritocracy and individualism.
   "All hiring and educational policies shall be based strictly on merit" (relational process defining sustainability as a function of meritocracy);
   "Government funding must not be allocated based on race, gender, or identity" (material process denying DEI as a legitimate criterion for resource distribution).

2. The rejection of DEI as an unsustainable and ideologically driven agenda.
   "Federal agencies are directed to eliminate race-based hiring policies" (material process removing DEI as a structural component of policy);
   "Institutions shall discontinue programs that promote racial or gender-based advantages" (material process mandating the dissolution of DEI-driven initiatives).

3. Education as a mechanism for national identity and economic efficiency.
   "Our schools must teach American values and historical accuracy" (relational process positioning education as a vehicle for national ideological coherence);
   "A competitive economy depends on a workforce selected through skill and merit" (relational process linking sustainability directly to economic productivity and merit-based selection).

4.2.2 Appraisal analysis

Sustainability and education would appear to be viewed through a lens of rejection and ideological certainty in the following appraisal analysis of Trump's EOs.

1. Sustainability as the preservation of meritocracy and individualism.
   "True fairness can only be achieved when identity is no longer a factor in education" (attitude: negative judgment of identity-based policies);
   "Merit-based hiring ensures the most qualified individuals lead our nation forward" (engagement: monoglossic assertion reinforcing individual achievement over structural intervention).

2. The rejection of DEI as an unsustainable and ideologically driven agenda.
   "DEI initiatives introduce inefficiencies and distort fairness" (attitude: negative evaluation of DEI as an unsustainable burden);
   "Federal education policies must correct course and restore ideological neutrality" (graduation: intensified language asserting DEI as an ideological deviation).

3. Education as a mechanism for national identity and economic efficiency.
   "American education must prepare students to contribute meaningfully to the economy" (attitude: aligning education with economic utility);
   "Our students deserve an education that instills national pride and historical truth" (graduation: reinforcing education as a nationalist imperative).

The linguistic and ideological patterns in Trump's three EOs bring forth a very different perspective on sustainability in education (Bonilla-Silva, 2010). In this case, DEI would appear to hinder meritocracy and economic efficiency. Indeed, these themes illustrate a vision of sustainability defined by the endurance of traditional structures. Transitivity analysis suggests that agency is assigned to federal institutions that stand as enforcers of ideological correction. The appraisal analysis further emphasises the evaluative stance of such authoritarian bodies in terms of rejection and ideological restoration. The language employed throughout these EOs reinforces the notion that sustainability hinges upon the dismissal of DEI, thereby aligning educational priorities with economic competitiveness and national cohesion. The perspective which emerges from the analyses of Trump's EOs seems to contrast with DEI-driven sustainability models pertaining to the Biden administration.

4. Discussion

This section brings together and contrasts the two policy provisions,

highlighting their distinct discursive, ideological, and structural approaches to educational governance. The comparative analysis of Biden and Trump's EOs on DEI and sustainability in education would appear to expose two opposing conceptualisations of sustainability and equity. Whereas Biden's policies frame sustainability in terms of institutional inclusivity and structural intervention, Trump's EOs, conversely, convey a view of sustainability that upholds highly conservative principles in the fields of educational legislation, economic efficiency, and ideological continuity.

The analysis highlights three major areas of contrast, listed below, which clearly define the oppositional viewpoints of the two administrations. These viewpoints are not merely limited to the educational arena and DEI but further encompass other systems of governance.

1. Sustainability as structural inclusivity vs. sustainability as meritocratic continuity;
2. Governmental responsibility in advancing or eliminating DEI;
3. Education as an inclusive economic resource vs. education as a nationalist and competitive institution.

The first controversy frames the sustainability measures enforced by Biden as dependent on inclusivity and on the attempt to break down systemic inequities. By contrast, Trump's EOs reject any form of inclusivity-driven legislation, thus positioning sustainability as the maintenance of a neutral, meritocratic, and economically efficient educational system. The following examples serve to illustrate this contrast in a salient manner:

Biden: *"Federal agencies shall implement policies to expand access for underrepresented communities"*

vs.

Trump: *"Race-based hiring and admissions shall be discontinued"*

Biden: *"Equitable education is essential to national prosperity"*

vs.

Trump: *"True fairness is only achieved through identity-neutral policies"*

The second key area in which contrast emerges concerns how each administration assigns responsibility to government institutions. Biden's policies position the federal government as an active agent in promoting DEI, Trump's EOs, on the other hand, frame government-led DEI initiatives as bureaucratic overreach, requiring elimination to ensure sustainability. Some examples are:

Biden: *"Federal agencies must ensure that DEI policies are implemented at all levels"*

vs.

Trump: *"Agencies shall eliminate programs that prioritize race or gender"*

Biden: *"Sustained investment in HBCUs is critical to an inclusive economy"*

vs.

Trump: *"Diversity mandates impose unnecessary burdens on American institutions"*

A final critical divergence is the function of education in sustaining national growth. Biden's policies position education as a tool for economic empowerment and equity, while Trump's EOs reinforce education as a mechanism for nationalist ideological continuity and economic competitiveness. This is exemplified as follows:

Biden: *"Investing in inclusive education strengthens national economic sustainability"*

vs.

Trump: *"American schools must prioritize skills that advance our global standing"*

Biden: *"A diverse workforce is key to innovation and progress"*

vs.

Trump: *"Education should prepare students for productive, ideologically neutral citizenship"*

The comparative analysis therefore reveals that sustainability in education is not a fixed concept but an ideologically flexible construct, shaped by competing political narratives about equity, governance, and national development. The Biden administration advances a progressive sustainability model, in which DEI stands as a structural necessity, conversely, the Trump administration upholds a conservative sustainability model, positioning DEI as an unsustainable deviation from meritocratic principles. These differing interpretations of sustainability highlight the broader ideological struggle over the role of education in shaping national identity and institutional governance (Schmidt, 2007).

6. Conclusion

The comparison between the two sets of EOs investigated throughout this study reveals that sustainability in education is not an absolute, universally

agreed-upon framework but a concept that is ideologically contingent and subject to redefinition. Indeed, the 'bending' (Bhatia, 2004) of sustainability occurs when political administrations reshape the discourse to align with their broader ideological goals, whether that implies viewing inclusivity as a structural necessity or eradicating identity-based policies to restore a perceived neutral baseline. Moreover, the temporal dimension of sustainability plays a crucial role. At different historical moments, sustainability in education has been framed as a progressive expansion of access, a reinforcement of economic priorities, or a return to nationalistic and meritocratic ideals. What one administration defines as an essential reform, another may see as an unsustainable deviation from tradition.

Given the contrasting interpretations of sustainability and DEI in educational policy, future research should focus on how these competing discourses influence policy implementation at institutional levels, particularly in higher education, public schooling, and workforce training. All stakeholders, be they policymakers, educators, researchers or advocacy groups, play a vital role in shaping the future of sustainability in education. Their engagement in policy development, institutional practice, and legal provisions will determine the long-term impact of these executive directives.

The authors firmly believe that by disseminating these findings through academic conferences, policy reports, and public engagement initiatives, a broader discourse on how sustainability and DEI are operationalised in national education systems can be broached. This research underscores the need for continued interdisciplinary analysis of how educational sustainability is shaped by today's shifting political landscapes. Future comparative studies could extend beyond the US context to examine global policy trends, assessing whether similar ideological tensions emerge in international approaches to sustainability and DEI in education.

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Environmental sustainability education and its impact on psychological well-being: A cognitive-behavioral approach

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Abstract

Psychological well-being is essential for promoting sustainable behaviors, yet awareness alone is insufficient. Economic and cognitive barriers often hinder eco-friendly choices. This article offers a theoretical reflection, supported by academic literature, on the applicability of Cognitive Behavioral Therapy (CBT) in fostering sustainable lifestyles. CBT can reduce cognitive distortions, enhance self-efficacy, and support value-based decisions. Techniques like mindfulness, nudging, and reframing all-or-nothing thinking can help bridge the intention-behavior gap. Schools and workplaces are key contexts for applying these strategies to promote lasting, environmentally responsible habits. A structured effort at social and educational levels is needed, but CBT provides key tools for a lasting sustainable mindset.

Keywords: Cognitive behavioral therapy, mindfulness, environmental sustainability, psychological well-being, personal values, psychology

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Introduction

Psychological well-being is a core element in educational processes and in the construction of an inclusive and sustainable society. From a pedagogical and psychological perspective, learning plays a key role in motivating change to improve awareness about environmental sustainability. Otherwise, to improve sustainable behaviors, information is not enough:

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people are often aware of the eco-sustainable behaviors should be, but they struggle to put them into practice.

A critical aspect is represented by economical accessibility of eco-sustainable choices, such as sustainable clothing or eco-friendly alternatives to disposable plastic. The so-called green gap phenomenon emphasizes that despite growing environmental awareness, many people struggle to translate their awareness into action due to economic, cultural, or psychological constraints.

Sustainability and psychological well-being: the role of Cognitive Behavior Therapy approach

Cognitive Behavioral Therapy (CBT) is one of the most widely practiced psychotherapeutic approaches worldwide, and its effectiveness has been demonstrated in the treatment of various disorders, including anxiety, depression, personality disorders, substance abuse, and insomnia (Thoma; Pilecki and McKay, 2015).

CBT can be described as an integration of Cognitive Therapy (CT) and Behavioral Therapy (BT). While traditional behavioral therapy focused exclusively on the observation and modification of observable behaviors, cognitive therapy introduced a crucial element: cognition. This addition expanded the scope of intervention, as it allows for the modification of thought patterns that influence behavior, rather than merely altering behavior directly.

The incorporation of cognition into therapy significantly enhances individuals' self-efficacy, as it enables them to intervene in their thought processes, thereby gaining greater control over their behaviors.

In addition to these foundations, CBT has evolved further with the emergence of the so-called “third wave” of cognitive-behavioral therapies, which includes approaches such as Acceptance and Commitment Therapy (Hayes; Strosahl; and Wilson, 1999). Dialectical Behavior Therapy (Linehan, 1987) Mindfulness-Based Cognitive Therapy (MBCT), and Compassion-Focused Therapy (CFT). These therapies integrate concepts of mindfulness, acceptance, and emotional regulation, broadening the scope of traditional CBT to address deeper psychological processes beyond just cognition and behavior.

In this sense, CBT can give cognitive instrument to assess a sustainable lifestyle and to promote changes in behavior in the direction of more conscious choices. Cognitive Behavior is an evidenced-base approach (Lofthouse; Davies and Hodgekins, 2025)**.** often use for psychological

diseases treatment, such as anxiety and depression, but also stress and habits management. So, it could also be used in environmental sustainability context. CBT could also be applied in treating the environmental distress (Doherty, 2024).

A recent study has highlighted that concern for sustainability essentially depends on how much people feel in harmony with their surrounding environment and the value they attribute to themselves, others, plants, and animals (Koessler; Heinz; and Engel, 2023). In this sense, a collectivist mindset, which prioritizes the protection of the community over a self-centered perspective, is more likely to lead to behaviors aimed at environmental sustainability. This seems to be influenced by the degree to which people feel interconnected with others and their level of empathy, particularly their ability to take another person's perspective.

In this context, Cognitive Behavioral Therapy (CBT) offers several interventions that can foster perspective-taking, one of which is the chair technique, originally developed by Fritz Perls (1951) in Gestalt therapy. This method involves guiding individuals to sit in different chairs and role-play different perspectives, allowing them to engage in a dialogue with themselves or with imagined others (Pugh, 2019). By shifting positions and embodying different viewpoints, individuals can gain a deeper understanding of others' experiences, fostering empathy and a greater sense of interconnectedness. Integrating such approaches into sustainability education or behavior change programs could enhance individuals' ability to recognize the broader impact of their actions and cultivate a mindset more attuned to collective well-being.

Consciousness training and change motivation

One of the principal obstacles to a sustainable lifestyle transition is the tendency to underestimate individual impact. Many people think "There's no point in me being sustainable if others aren't. It won't change anything." CBT approach works on this kind of cognitive distortion and help people in many ways, identifying and challenging dysfunctional beliefs, such as fatalistic thinking or all-or-nothing thinking. Dichotomous thinking describes a rigid cognitive style that frames reality in strict terms such as "true or false" or "right or wrong". This type of cognitive process can lead to statements like "Either I live in a perfectly sustainable way, or it's not worth trying", resulting in a sense of disengagement and lack of responsibility toward environmental issues.

Treating dichotomous thinking can lead to benefits in developing coping strategies (Mieda et al., 2021) to manage environmental distress, just as it does for other types of stress and psychological conditions. Moreover, it can promote the adoption of healthy habits, as has already been proven in the case of dietary behaviors (Alberts, 2012).

One of the most common strategies for intervening in dichotomous thinking is cognitive restructuring, which helps people identify maladaptive thoughts, such as all-or-nothing thinking, and understand how this kind of thought distances them from what they truly desire (e.g., adopting a more sustainable lifestyle). Other techniques include the problem-solving approach, in which people are guided to break down a problem into smaller, manageable steps (e.g., *"I won't only buy second-hand clothing, but I will gradually stop purchasing fast fashion in large quantities"*). The gray scale technique helps people situate themselves within a continuum of graduality between two opposite behaviors.

Cognitive reconstruction could help improve self-efficacy too, that is the perception of being able to effectively impact reality. Studies have shown that higher self-efficacy is correlated with a greater likelihood of adopting sustainable behaviors (Bandura, 1997).

Create concrete plan of action with little and progressive steps that could reduce the distance between intention and behavior. For example, consider using public transportation at least twice a week instead of completely giving up the car.

The Acceptance and Commitment therapy in facing environment distress

Acceptance and Commitment Therapy (ACT) is a psychological approach that includes techniques like mindfulness, behavioral change, and cognitive flexibility to help individuals match their actions with their values. At its core, it promotes the idea that psychological well-being is not achieved by eliminating distressing thoughts or emotions but by developing a flexible, values-driven approach to life, where individuals learn to accept what is beyond their control, commit to personally meaningful values, and take concrete steps toward them. ACT is applied not only to psychopathological conditions such as anxiety, depression, or personality disorders but also in other contexts, such as performance at work (Hayes et al., 2006). According to Hayes (2012) ACT approach can be defined by six main processes:

1. Acceptance that is the active and aware embrace of private experiences without unnecessary attempts to change their frequency or form.

2. Cognitive defusion which refers to a positive detachment from maladaptive thoughts. For example, in the context of environmental distress, this technique could help individuals distance themselves from catastrophic thoughts such as *"Climate change is unstoppable, and nothing I do will make a difference".* These and similar exercises help individuals see their thoughts for what they are – mental events rather than absolute truths – allowing them to respond more flexibly and effectively.
3. Being present: Acceptance and Commitment Therapy encourages voluntary contact with the present moment through mindfulness or other non-contemplative techniques. Research has shown that such techniques reduce perceived stress (Khoury et al., 2015).
4. Noticing-self: The noticing self is a transcendent and flexible sense of self that arises from perspective-taking and conscious awareness. Unlike the conceptualized self, which is based on personal narratives and self-descriptions, the noticing self allows individuals to observe their experiences, thoughts, and emotions without attachment or overidentification. For example, someone who sees themselves as a "practical person who values convenience" might resist sustainable choices like using public transport. In this way, people could make eco-friendly decisions, in line with sustainability values. Acceptance and Commitment Therapy connects behavior to intrinsic values, making actions meaningful in the present rather than just future goals. For example, someone who values environmental responsibility doesn't just aim to "be sustainable" but actively lives out sustainability in daily choices – recycling, reducing waste, or conserving energy – because the value itself reinforces the behavior. ACT fosters this through metaphors, self-exploration, and experiential exercises, making values a continuous process rather than a distant outcome.
5. Committed Action: Acceptance and Commitment Therapy promotes committed action, where behavior is continuously adjusted to align with personal values. Unlike impulsivity or avoidant persistence (repeating ineffective behaviors to escape discomfort), committed action involves structured, goal-oriented changes tailored to specific challenges. For example, in managing climate anxiety, a person might impulsively avoid discussions about environmental issues or persist in ineffective guilt-driven actions. ACT instead encourages sustained, values-based behaviors, like consistently reducing waste or engaging in climate advocacy, reinforcing commitment over time (Levitt et al., 2004; Dahl et al., 2005).

6. Psychological flexibility: is the ability to be fully present, open to experiences without defense, and to adapt behavior in alignment with chosen values. It is the core goal of Acceptance and Commitment Therapy (ACT), integrating processes like acceptance, cognitive defusion, mindfulness, noticing self, values, and committed action**.** For example, in environmental sustainability, someone may avoid acting because of the scale of the climate crisis. In the context of sustainability, ACT can be a very useful way to prevent distress, frustration and pressure. However, it is important to consider that ACT does not aim to eliminate the psychological distress related to environmental issues but rather to foster cognitive flexibility, encouraging the development of new ways of interacting with one's experience. ACT supports the ability to remain committed to long-term environmental goals despite uncertainty with psychological flexibility.

This approach suggests that sustainable action is not about achieving a state of perfection but about making consistent, values-based choices even in the presence of difficulties. By integrating psychological flexibility with environmental commitment, ACT provides a framework that can enhance both individual well-being and collective efforts toward a more sustainable future.

One of the central processes, studied by ACT, is *cognitive defusion*, which helps reduce the impact of negative thoughts by recognizing them as mere thoughts, rather than absolute truths. Through experiential exercises – such as repeating a word until it loses its meaning or imagining thoughts as leaves floating down a stream – individuals can learn to observe their thoughts with greater detachment, reducing their power to dictate behavior.

ACT can also help in facing uncomfortable emotions by allowing these emotions to exist without letting them become barriers to meaningful action. This approach is deeply connected to *mindfulness and present-moment awareness*, which is the reflection on what is happening in the here and now, with a more grounded and responsive way of engaging with the world.

This perspective, known as "self-as-context," fosters a greater sense of psychological space, allowing for more flexible and adaptive responses to life's challenges. At the heart of ACT is also the process of values clarification – helping individuals define what truly matters to them, beyond fleeting emotions or external expectations. From this awareness emerges committed action – the ability to take concrete steps toward long-term goals, even in the face of obstacles and discomfort.

When it comes to environmental sustainability, being present in the moment can help people feel more connected to nature and make more thoughtful choices in everyday life. Cognitive defusion, for instance, can

support people in challenging limiting beliefs – like thinking their actions don't matter – and in making concrete changes to how they live, facing uncertainty, and acting in ways that are more environmentally conscious. Seen this way, both personal and collective change become less of a struggle and more of a chance to act in line with what truly matters.

Sustainability in Schools and Businesses: A Behavioral Approach

Schools and workplaces play a crucial role in making sustainable choices throught CBT-based programs. It is proven that psycho-educational interventions on enviromental sustainability in school can make the difference and involes the integration of practical activities with behavioral strategies to reinforce new habits. For example, the pledge contract has been shown to increase the likelihood of maintaining a public commitment to eco-friendly behaviors. In the same way, training for managers and business leaders focuses on integrating sustainability into corporate policies, emphasizing the role of positive reinforcement and immediate rewards in encouraging environmentally friendly behavior. Another optimal strategy is the use of the so-called "nudging", which involves small cognitive prompts thtat facilitate sustainable choices without imposing them. For example, Garnett (2019) discovered that simply redesigning workplaces spaces to make vegetarian option more accesible on menu, can increase their selection from customers by 25%. Nudging is the deliberate modification of how choices are presented (by putting them in evidence, for example) to encourege a predicted outcome; it has been widely studied for its effectiveness in promoting healthy habits, including prenatal screening and breast screening (Hofmann & Stanak, 2018). In this context, nudging could help people who may find difficoulty making decision -often reffered to as "bad choosers"- beacome more consistent in making sustainable choices. Adjusting the enviroment to influence people's decisions has been identified as a key strategy for promoting behaviors such as adopting a plant-based diet, increasing the availability of vegetarian food in restaurants, or choosing sustainable clothing brands. Research has also shown that nudging can improve engagement in mental health treatment, while highlighting the social benefits of sustainable choices, such as recycling, can further enhance their adoption. A recent study suggest that nudges are particularly effective for low-effort behaviors, such as opting for healthier snack instead of a cookie at the supermarket

Aligning Values with Action: A Path to Sustainable Well-Being

Cognitive Behavior Therapy also works on personal values and self-esteem, key factors for adopting long-term sustainable choices. Often, those who live in conditions of economic insecurity lack the cognitive resources and knowledge that are crucial for a long-term commitment to sustainability. Psychological research highlights that individuals experience greater well-being when they actively engage in behaviors aligned with their core values, rather than merely endorsing them. A recent intervention, "Acting on Values" (AoV), demonstrated that taking concrete steps to live according to one's principles enhances both hedonic and eudaimonic well-being, fostering greater life satisfaction and emotional resilience. (Bojanowska et al., 2022). This observation is particularly relevant to sustainability, as many people express deep concern for the environment but struggle to consistently align their actions with their values. Encouraging individuals to bridge this 'value importance/behaviour gap' by integrating sustainability into everyday habits – such as conscious consumption, waste reduction and advocacy – could not only support environmental goals but also contribute to a deeper sense of personal fulfilment and purpose.

Thus, the key interventions should focus on

- A higher psychological well-being, that promotes sustainability: When people feel in control of their choices and less overwhelmed by stress, they are more likely to take care of the environment as well.
- Self-efficacy training can enhance resilience to economic difficulties, helping individuals find sustainable strategies suited to their context (e.g., self-production, conscious consumption, circular economy).
- Mindfulness-based approaches which can reduce impulsive consumption – one of the main causes of unsustainable purchases – by enhancing the ability to distinguish real needs from momentary desires.

Conclusions

The adoption of sustainable choices cannot be left solely to individual initiative; it requires a structured effort at both educational and social levels. However, a cognitive-behavioral approach can be a key ally in this process, providing practical tools to enhance awareness, motivation, and self-efficacy – essential elements for integrating sustainability into everyday life.

Environmental psychology interventions based on CBT in schools, workplaces, and public policies can facilitate the transition to a society more mindful of its ecological impact, ensuring that no one is left behind. As

studies show, when people experience greater psychological well-being, their choices improve as well – both for themselves and for the planet.

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Promoting social well-being and psychophysical health through environmental restoration

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Abstract

Activist associations play a crucial role in promoting sustainability through initiatives focused on environmental, social, and cultural restoration and enhancement. These efforts not only contribute to the preservation of ecosystems and local heritage but also foster collective well-being by strengthening community bonds and social inclusion. Furthermore, by directly involving local communities, these associations empower individuals, and increase social capital. Additionally, related physical activities, such as environmental clean-ups or urban farming, enhance participants' psychophysical well-being by encouraging active lifestyles. This paper explores the impact of such initiatives on quality of life, highlighting the connection between sustainability, health, and social aspects.
Keywords: sustainability, environmental restoration, psychophysical wellbeing, social inclusion

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Introduction

During recent decades has been observed wide activity of grassroots movements and activist associations that challenges and integrates traditional models of governance and development. These organizations operate based on the idea that sustainability is not only an environmental concern but multidimensional. Indeed, it encompasses many aspects such as

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social equity, cultural resilience, and individual well-being (Ariyon et al., 2024). One of the main issues faced by communities is the environmental degradation and socio-cultural fragmentation (Jeong & Seol, 2022). In this scenario, activist groups have stepped in to contribute with sustainable solutions that address both immediate local challenges and broader systemic issues. Their work, which ranges from urban farming to heritage restoration, demonstrates that collective action can yield tangible benefits for ecosystems and human health (Ihle et al., 2024). In Italy, the impact of such initiatives has been particularly notable and the Italian government acknowledged the importance of voluntary participation in green activities (Ministero dell'ambiente e della tutela del territorio e del mare, 2017). In fact, Italian activist associations have long been present in guiding community-led projects that integrate ecological restoration with social and cultural preservation. Over the past decade, numerous local groups have transformed abandoned urban spaces into renewed community gardens, revitalized historical sites, and organized environmental clean-ups that not only protect local biodiversity but also reinforce a sense of shared identity (Comune di Napoli, 2020; Ficocelli, 2022). Furthermore, in Italy, as in the rest of the world, a strong contribution to the initiation of such activities comes from deep-rooted cultural traditions, since the connection between the individuals and the land and local heritage is seen as a critical component of the individual and the collective identity.

One of the most significant dimensions of these initiatives is their effect on physical well-being. Participation in community-based activities such as urban farming, local clean-up drives, and heritage restoration projects offers opportunities for physical exercise and active engagement with the environment (Ihle et al., 2024). Studies have shown that involvement in urban gardening and other outdoor activities is associated with measurable improvements in cardiovascular health, muscle strength, and overall fitness (Hume et al., 2022). For instance, scientific literature reported that participants in community gardening projects experienced improvements in metabolic health markers and physiological wellness, including neuroendocrine and affective restoration from stress (Van Den Berg & Custers, 2011). Indeed, such physical activities, when combined with the social interaction inherent in community work, contribute to reduced stress levels and improved mental health, reinforcing the idea that sustainable practices can directly benefit individual well-being. Furthermore, the physical dimension of these activities is intricately linked to the broader concept of community health. The act of coming together to work on local projects not only promotes exercise but also fosters a supportive social environment (Kawachi & Berkman, 2014; Sugiyama et al., 2008).

Community initiatives often serve as hubs for intergenerational interaction, where knowledge is exchanged between older residents and younger community members, thereby enhancing social cohesion and reducing feelings of isolation. This sense of belonging and shared purpose has been associated with lower incidences of depression and anxiety, suggesting that the physical and mental health benefits of such activities are mutually reinforcing (Costa & Coimbra, 2024).

Furthermore, it should be noted that in addition to the direct health benefits, the role of activist associations can also enhance social capital (Kawachi & Berkman, 2014). The connections that can be created through these community engagements facilitate trust and reciprocity among residents, which are essential in times of economic or environmental crises. Social capital has been linked with improved local governance and resilience, and grassroots networks can be considered a safety net able to provide informal support systems that complement formal state interventions (Pretty, 2003). Several studies focused on documenting cases where communities with strong local ties were able to rapidly mobilize resources in response to emergencies, hence reducing the impacts of crises (Schobert et al., 2023). Moreover, the cultural implications of these initiatives should also be acknowledged. Historical and artistic heritage provides a unique context in which sustainability is interwoven with cultural preservation (Marzano & Castellini, 2024). Activist associations often collaborate with local historians, artists, and cultural institutions to restore historic sites and promote traditional practices. These cultural projects not only preserve the heritage of communities but also sustain and foster intangible assets such as community pride and identity (European Union, 2021). As a consequence, by revitalizing neglected spaces, these groups promote an environment that offers a deeper understanding of local history and traditions, that strengthens the sense of belonging and community. It is now globally clear that the concept of sustainability must be understood as a holistic paradigm. Institutions over the years have indeed been taking action to meet the demands of communities and recognizing the importance of volunteering and activism in this regard. National institutions, along with several regional authorities, activated programs to support these grassroots efforts, providing funding and technical assistance to projects that demonstrate significant social and environmental benefits. This policy shift underscores the importance of integrating bottom-up approaches with top-down governance to create more adaptive and resilient urban environments.

Activism and Environmental Restoration

The main purpose of activist initiatives is the commitment to restoring and preserving natural environments, also including green spots within the cities. This corresponds to a goal that at the same time promotes sustainability and enhances human wellbeing. Activist associations mobilize community members to engage in activities such as environmental clean-ups, urban greening projects, tree planting, and waterway restorations (Hossain, 2018; McKinley et al., 2023). These efforts beyond mitigating pollution and fostering biodiversity in both urban and rural settings, also serve as vital contributors to sustainable development. These initiatives help integrate ecological restoration with social and cultural goals, and reduce carbon footprints, enhance local resilience, and create multifunctional landscapes that support both natural processes and community life. Sustainability in this context extends beyond environmental conservation; it includes the efficient use of resources, long-term planning, and the creation of systems that can cope with environmental stresses (Weber, 2000). Activist groups often promote sustainable practices by using local and natural materials, emphasizing low-impact techniques, and advocating for policies that support renewable energy and resource recycling. Urban greening projects, for example, contribute to the broader sustainability agenda by improving air quality, regulating urban temperatures, and offering spaces that encourage eco-friendly behaviors. This holistic approach takes into consideration the immediate environmental concerns and also builds the bases for long-term ecological health, aligning with global sustainability goals (European Union, 2021; Tzoulas et al., 2007). In addition to these environmental benefits, participation in restoration activities has a deep impact on physical activity and well-being too. Engaging in projects like environmental clean-ups and tree planting include moderate to vigorous physical activities that provide participants with regular exercise. Furthermore, several studies have shown that exposure to green spaces and nature-based activities is associated with improved cardiovascular health, reduced obesity rates, and better overall fitness (Maas et al., 2006; Sugiyama et al., 2008). In urban environments, even modest community gardening projects can result in significant health benefits. For example, research indicates that regular participation in such activities can lead to measurable reductions in blood pressure and improved metabolic health.

Related to these aspects, the Italian context provides characteristic evidence of these benefits. Including bigger and smaller towns, community-led urban greening initiatives have not only improved local air quality but have also fostered increased physical activity among residents. According to

data from the Istituto Superiore di Sanità, regions that have invested in urban green spaces have observed a correlation with lower rates of respiratory and cardiovascular issues (Istituto Superiore di Sanità, 2025). Furthermore, these initiatives serve as catalysts for social interaction, bringing together diverse community members, reinforcing local identity, and reducing social isolation. In Italy, where family and community ties have long been central to daily life, such projects have enhanced social cohesion and created informal support networks that contribute to both mental and physical health (European Commission, 2021). Beyond the direct benefits of physical exercise, environmental restoration activities create a positive feedback loop. The physical act of engaging with nature deepens an individual's connection to their surroundings, fostering a sense of responsibility and encouraging continued sustainable practices (Weber, 2000). This dynamic is even stronger in regions whose communities relate their identity with cultural heritage. Local initiatives often involve restoring historic sites or revitalizing abandoned urban spaces, transforming them into community hubs that support physical, mental, and social well-being (Auclair & Fairclough, 2015). These projects not only contribute to cleaner, greener cities but also help build a resilient and inclusive society that is better equipped to handle environmental and social challenges (Kuo & Sullivan, 2001; Wolch et al., 2014).

After analyzing this information we can state that activist associations largely contribute to environmental restoration by advancing sustainability, promoting physical activity, and enhancing overall wellbeing. Their initiatives bridge the gap between ecological conservation and human health, demonstrating that actions such as urban greening, community clean-ups, and heritage restoration can yield extensive benefits, from reducing urban pollution and mitigating climate change to improving cardiovascular health and fostering social inclusion.

Community Empowerment and Social Capital

Beyond the physical improvements to their surroundings, activist associations also determine influence on the social structures of communities. By actively involving local residents in decision-making and direct action, these organizations create a sense of ownership and shared responsibility that transcends simple volunteerism (Graham & Howard, 2008). When community members contribute to local projects, they consolidate their commitment to collective wellbeing, and this results in a process that reinforces social capital, which is increasingly recognized as

essential for community resilience in the face of rapid social and environmental changes (Woolcock, 1998). This participatory approach to community empowerment generates numerous positive outcomes. Empowerment through engagement not only builds trust among neighbors but also facilitates the creation of robust networks capable of mobilizing support during times of crisis or change (Li et al., 2005). The inclusive nature of these initiatives encourages the exchange of ideas, skills, and resources, leading to enhanced problem-solving capacities at the grassroots level. Social scientists have found that when individuals are empowered to take an active role in their communities, the resulting social cohesion and mutual trust can lead to a more resilient and adaptive community cooperation (Nesterova & Spulber, 2020; Sommer, 2019). Such outcomes are fundamental in both urban and rural settings, where challenges demand collective action and rapid responses. To this regard, one key element is the notion of "bonding" and "bridging" social capital. Bonding social capital refers to the close connections among individuals within a community, while bridging social capital extends to relationships across diverse social groups. Activist associations often serve as platforms for both types: by working together on shared initiatives, participants forge strong intra-community ties, and by connecting with other groups, they also build networks that span social, cultural, and even geographic boundaries (Agnitsch et al., 2006). These networks have been shown to reduce isolation, improve access to resources, and enhance overall community well-being. The benefits of such social capital can affect many contexts. For instance, Robert Putnam's seminal work, *Bowling Alone* (Putnam, 2001), illustrates how declines in community engagement can erode social cohesion, whereas renewed involvement in local activities helps rebuild this vital resource. Similarly, studies by Woolcock and Pretty underscore that higher levels of social capital are associated with improved collective management of resources and enhanced community resilience (Pretty, 2003; Woolcock, 1998). These insights are especially pertinent to communities facing modern challenges, where traditional institutions may no longer provide the necessary support structures.

Moreover, communities that experience high levels of empowerment and social capital are often better positioned to advocate for sustainable development and environmental justice (Selman, 2001). The act of engaging with local governance and decision-making democratizes the process and ensures environmental and social policies that are more reflective of local needs and values. In this way, the social networks built through activist associations can serve as a counterbalance to top-down approaches, fostering bottom-up innovations that are more adaptive and sustainable in the long run.

Empirical evidence also supports the link between community empowerment and health outcomes. Kawachi and Berkman highlight how social cohesion and trust within communities are closely linked to better health metrics, including lower rates of mental health issues and improved physical well-being (Kawachi & Berkman, 2014). Furthermore, in the aftermath of disasters, Aldrich has demonstrated that communities with strong social capital are more effective in their recovery processes, as the networks formed through local activism provide critical support systems (Aldrich, 2012). These findings suggest that empowering communities is not only beneficial for social and environmental outcomes but also for enhancing individual health and well-being. Hence, activist associations that promote community empowerment and build social capital create a ripple effect of positive change. They prove themselves to be able to improve the physical environment and also foster a sense of collective identity and mutual responsibility that is crucial for long-term resilience. Strengthening both bonding and bridging social capital, these initiatives enhance community capacity to respond to crises, advocate for sustainable practices, and ultimately improve overall quality of life.

Psychophysical Well-being and Active Lifestyles

A further significant impact of activist associations is their ability to enhance the psychophysical health of their participants. The physical activities embedded in many sustainability initiatives, such as urban farming, community gardening, and environmental clean-ups, offer much more than a means to improve local environments (Sugiyama et al., 2008); they serve as vital opportunities for exercise, social engagement, and stress reduction. These activities are particularly effective in urban settings, where sedentary lifestyles and reduced access to natural spaces contribute to a range of chronic health issues (Van Den Berg & Custers, 2011). It should be stated that the structured nature of community gardening and urban farming requires regular, moderate physical activity that can help counteract the effects of modern sedentary living. For instance, studies have demonstrated that participation in gardening activities is associated with improved cardiovascular health, better metabolic profiles, and enhanced muscle strength (Armstrong, 2000; Litt et al., 2023). Regular physical exertion in these settings can improve physical fitness and also contribute to lower rates of obesity and chronic diseases. Beyond the physical exertion itself, the act of nurturing plants and managing green spaces has been linked to psychological benefits, including reduced symptoms of anxiety and

depression. In addition to improving physical health, these sustainability initiatives foster social interaction and community cohesion (Rogge et al., 2018). Active participation in environmental clean-ups and urban gardening projects creates a context for regular social engagement, which is known to improve mental wellbeing (Monteiro et al., 2024). The communal aspect of these projects helps build a support network among participants, reducing feelings of isolation and increasing the sense of belonging. These interactions often lead to improved self-esteem and a heightened sense of purpose which are factors that are often reported as fundamental in facing the stress and mental fatigue that many urban dwellers experience (Berto, 2014).

Research into the benefits of contact with nature reinforces these findings. A meta-analysis on gardening, for example, revealed that regular engagement in such activities is significantly correlated with better self-reported health outcomes and lower stress levels (Soga et al., 2016). Likewise, community-based studies have shown that individuals who participate in structured green space activities, such as those organized by activist associations, experience notable improvements in both mental and physical health. This dual benefit that enhances fitness and also reduces psychological stress, is able to create a comprehensive model for community development that aligns environmental stewardship with public health objectives (Albright & Hurd, 2023; Schwartz et al., 2023). Beyond physical health, the psychosocial benefits of these activities are profound. Regular interaction with nature and participation in communal activities have been shown to lower cortisol levels which is a biological marker of stress, and at the same time increasing feelings of relaxation and well-being (Van Den Berg & Custers, 2011). Such findings are reinforced by research that indicates that even minimal exposure to green environments can significantly improve mental health and overall quality of life (Maller et al., 2006). It should also be included that broader reviews have highlighted that public parks and other green spaces provide critical venues for physical activity and social engagement, ultimately contributing to reduced health inequalities. For example, Kaczynski and Henderson reviewed evidence suggesting that the availability of well-maintained parks is positively associated with higher levels of physical activity among residents (Kaczynski & and Henderson, 2007). This can be considered a finding that underscores the public health importance of green space recovery through community activism.

Limitations and future perspective

Although a substantial body of literature documents the diverse benefits

of social activism, which ranges from enhanced environmental quality to increased physical activity and improved mental health and reinforced social capital, there remains a significant gap in longitudinal research that systematically evaluates these outcomes over extended periods. While cross-sectional studies have effectively demonstrated that engagement in activities such as urban gardening, community clean-ups, and local environmental advocacy can lead to immediate improvements in both individual well-being and community resilience, few investigations have pursued the long-term trajectories of these benefits among participants who are consistently active over years or even decades. It is crucial to design and implement longitudinal studies that objectively measure the intensity, frequency, and depth of engagement in social activism practices. Such research should integrate multifaceted assessment tools that combines quantitative metrics such as physiological health indicators and frequency of participation with qualitative evaluations of social cohesion, psychological resilience, and community empowerment. By tracking these variables over time, researchers could elucidate the dynamic interplay between sustained activism and its cumulative impacts on individual health outcomes, group dynamics, and broader societal change. In doing so, we would gain critical insights into how continuous participation in community-based initiatives contributes to enduring transformations in social structures and public health, and how these changes might inform policy development and the strategic allocation of resources in support of sustainable community development.

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Sport as a Tool for Inclusion and Sustainability in Secondary School: A Qualitative-Quantitative Analysis

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Abstract
Sport promotes social inclusion and sustainability in schools. This mixed-method study, conducted in a secondary school in Naples, examines the impact of an innovative sports program on inclusion and sense of belonging, aligned with the UN 2030 Agenda. A total of 100 students participated, with an experimental group engaging in cooperative sports and a control group following traditional physical education. Results showed improved peer collaboration and a 15% increase in belonging and 12% in inclusion in the experimental group. The study highlights the role of structured sports in fostering cohesion, well-being, and inclusive school communities.
Keywords: Social inclusion, Sustainability in education, Cooperative sports didactic, Sense of belonging, Inclusive physical education

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Introduction

Social inclusion and building sustainable communities represent fundamental challenges in the contemporary educational context. Schools, as environments of formation and growth, have a responsibility to promote educational practices that encourage the active participation of all pupils, regardless of their individual and social characteristics (Booth & Ainscow, 2011). In this framework, sport, understood as structured and collaborative

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physical activity, can play a crucial role in fostering social cohesion, reducing inequalities and promoting sustainability values (UN, 2015).

Numerous studies highlight the educational potential of sport in the school context. According to Bailey et al. (2009), participation in sports programmes not only promotes physical health, but also the social and psychological development of students. Sport can promote the integration of students with special educational needs and increase their self-esteem and sense of belonging to the school community (Goodwin & Watkinson, 2000). In addition, Côté and Fraser-Thomas (2007) point out that playing sport in school can promote the development of social-emotional skills that are essential for adult life.

This study aims to investigate the role of sport in building inclusive communities in a secondary school in Naples, specifically exploring the sense of belonging and integration among students. The research falls within the theoretical framework of inclusive education (Slee, 2011) and community pedagogy (Wenger, 1998), paying particular attention to the benefits of sport in facilitating positive relational dynamics among peers (Holt et al., 2017).

The study aligns with the Sustainable Development Goals (SDGs) of the 2030 Agenda, specifically:

- Goal 3: Health and well-being, promoting healthy lifestyles through physical activity (World Health Organization, 2018).
- Goal 4: Quality education, ensuring equal learning opportunities and reducing barriers to schooling (UNESCO, 2020).
- Goal 10: Reduce inequalities by promoting the integration of students from diverse backgrounds and fostering mutual respect (Coalter, 2013).
- Goal 11: Sustainable cities and communities, creating more inclusive and participatory school environments by sharing sports spaces and strengthening social relations (Spaaij, 2013).

Several studies have shown that sport can be an effective tool for promoting active citizenship and sustainable development (Schulenkorf, 2012). Indeed, the practice of sport not only improves students' quality of life but also contributes to the formation of values such as cooperation, respect and inclusion (Donnelly & Coakley, 2002). According to Fraser-Thomas et al. (2005), well-structured physical activity programmes can foster a sense of belonging and trust among peers, which are fundamental to creating more cohesive school communities. In particular, physical activity promotes psychological well-being and reduces the risk of social isolation among adolescents (Eime et al., 2013). The opportunity to share common goals through sport helps students develop meaningful relationships and overcome cultural and language barriers (García Bengoechea et al., 2017). According

to Putnam's (2000) theory of social capital, collective participation experiences, such as sport, foster the creation of strong social networks, which are essential for the well-being of communities.

In light of these considerations, this study aims to analyse how sport can contribute to building more inclusive and sustainable school communities, focusing on students' sense of belonging and integration.

Methods

The aim of this study is to analyse how the practice of sport can promote the construction of inclusive and sustainable school communities in a secondary school in Naples, with particular attention to the sense of belonging to the peer group and the integration of students. The research fits into the theoretical framework of inclusive education (Booth & Ainscow, 2011) and community pedagogy (Wenger, 1998), assessing the impact of sport on relational dynamics and social cohesion processes.

Several studies have shown that participation in sporting activities can promote school integration and improve students' emotional well-being, contributing to a more equitable and welcoming environment (Eime et al., 2013). In particular, Putnam's (2000) theory of social capital highlights how collective participation experiences, such as sport, can strengthen social bonds and foster peer support. Furthermore, Coalter (2013) highlights how physical activity structured from an inclusive perspective can reduce educational inequalities and promote active citizenship.

In light of these premises, this study aims to evaluate the effectiveness of an innovative motor education programme based on cooperation and inclusion in comparison to the traditional competitive model, thus contributing to the discussion on educational strategies to foster equity and social inclusion in schools.

- *Research Design*

The study adopts a qualitative-quantitative approach to analyse the impact of sport on school inclusion and the sense of belonging among students in a secondary school in Naples. The aim is to understand how the practice of sport influences relational dynamics and the perception of inclusion within the school community. The integration of qualitative and quantitative methods allows for a more complete understanding of the phenomenon, avoiding the limitations that would result from using only one methodological approach (Creswell & Plano Clark, 2017).

- *Qualitative analysis*

For the qualitative analysis, semi-structured interviews were conducted with both teachers and students, belonging to both the sample group (students involved in sport activities) and the control group (students not involved in sport activities). The interviews were constructed around themes related to perceptions of inclusion, participation in group dynamics and the role of sport in facilitating the building of social relationships (Smith & Sparkes, 2016).

In particular, the following aspects were investigated:

- Pupils' participation in group activities during sports lessons and in everyday school life, taking into account the role of sport in strengthening collaborative dynamics (Bailey, 2006).
- Perceptions of peer support and the role of sport in fostering positive interpersonal relationships, an aspect highlighted by studies showing that collective physical activity can improve social skills (Fraser-Thomas et al., 2005).
- The sense of belonging to the school community, with a focus on the interaction between students of different abilities, socio-cultural backgrounds and levels of sporting performance, in line with the literature on sport as a tool for inclusion (Eime et al., 2013).
- Teachers' views on the contribution of sport to classroom cohesion and the reduction of episodes of exclusion or discrimination, in line with research highlighting the importance of sport in school integration (García Bengoechea et al., 2017).

MAXQDA software, a dedicated programme for qualitative analysis of textual data, was used to analyse the qualitative data. The analysis followed an inductive approach, identifying emerging categories from the interview transcripts, with a focus on the concepts of inclusion, active participation and social cohesion. The use of digital tools for qualitative analysis improves the accuracy of identifying patterns and recurring themes (Silver & Lewins, 2014).

- *Quantitative analysis*

The quantitative analysis was based on the administration of two standardised instruments to measure school inclusion and sense of belonging:

- Sense of School Belonging Scale (SOS): used to assess students' level of identification with the school community, perception of peer and teacher support, and level of involvement in school activities (Goodenow, 1993).
- Inclusive Processes Rating Scale (SVPI): used to measure perceptions of school inclusion by analysing dimensions such as active participation in lessons, relationships with peers and perceptions of equity and accessibility of educational activities (Booth & Ainscow, 2011).

Questionnaires were administered to both groups (sample and control), before and after the observation period of the sports activities, to assess any changes in levels of inclusion and sense of belonging. The use of validated psychometric instruments allows for reliable data that can be compared with previous studies.

The data collected were analysed using inferential statistical techniques, with the aim of identifying any significant differences between groups and verifying the impact of sport on perceptions of inclusion in school. Quantitative analysis was conducted using SPSS software, which enabled statistical tests to measure the effectiveness of the sport intervention on perceptions of inclusion (Field, 2018).

The integration of qualitative and quantitative methods allows for a deeper and more comprehensive view of the phenomenon under study, combining the interpretation of individual experiences with measurable and objective data. This approach allows for triangulation of findings and strengthens the validity of conclusions (Tashakkori & Teddlie, 2010).

- *Participants and sampling*

The study was conducted in a secondary school in Naples, specifically in a second grade class, with the aim of examining the impact of sport on inclusion and the sense of belonging to a peer group.

The sample consisted of 100 pupils aged between 11 and 14, 40 of whom were from abroad. In addition, 10 physical education and humanities teachers participated in the study with the aim of observing and evaluating inclusion processes within sport and school dynamics.

The students were selected on the basis of their participation in school sports programmes and divided into two groups:

- Control group (50 students): continued with traditional physical education classes, following the standard school curriculum.
- Sample group (50 students): participated in an innovative motor education programme, characterised by structured sports activities with a specific focus on inclusion and cooperation.

Both groups included 20 foreign students to ensure an equal distribution of cultural diversity and to assess possible differences in integration processes between the control and sample groups. This aspect was crucial for analysing the role of sport as a tool for social inclusion and for understanding whether and how physical activity can facilitate interaction between students from different cultural backgrounds.

The students' inclusion in the study was based on specific criteria:

- Attend the seventh grade of the school under study.
- Not failing at school, in order to ensure homogeneity in the level of cognitive and emotional development of the participants.

- Being of foreign origin (in the case of non-Italian students), but having lived in Italy for at least one year and having a minimum level of knowledge of the Italian language that would allow them to participate actively in sports activities and social interactions.

The study took place over 8 months, with 6 hours per week dedicated to sports activities.

Description of the educational intervention

The educational intervention was structured to analyse the impact of sports practice on the sense of belonging and school inclusion, with a clear differentiation between the activities carried out by the sample group and the control group. Both groups participated in 6 hours of motor activity per week for a period of 8 months, with different teaching methods to assess the effectiveness of an innovative approach based on cooperation and inclusion compared to traditional motor education teaching.

- *Control group: traditional physical education*

The control group followed a motor education programme in accordance with ministerial guidelines, with a predominantly technical and performance focus. The activities were structured in modules dedicated to the development of individual motor skills and the practice of codified sports, without an explicit focus on inclusion or the strengthening of relational dynamics among students.

Suggested activities included:

- Individual and team exercises aimed at improving basic motor skills such as running, jumping, throwing and motor coordination, with a gradual progression in difficulty (Bailey, 2006).
- Traditional sports modules focusing on the technique and rules of sports such as athletics, football, volleyball and basketball. Lessons focused on competition and individual performance, with moments of competence testing through games or specific skill tests (Fraser-Thomas et al., 2005).
- Motor assessment tests, used to monitor students' progress in different physical skills and compare them with standardised parameters provided by the school curriculum (Eime et al., 2013).
- Stretching and relaxation activities, integrated at the end of the lesson to promote muscle recovery and physical well-being, in line with the World Health Organization recommendations on physical activity for adolescents (World Health Organization, 2018).
- The approach used in the control group was based on transmissive teaching, with a central role for the teacher in directing activities and

assessing progress. Pupil interaction was mainly limited to moments of team play, with no explicit focus on developing interpersonal skills or creating an inclusive climate.

- *Sample group: innovative inclusive physical education programme*

The sample group followed an innovative physical education programme based on a cooperative and inclusive approach, in which physical activity became a means to promote cooperation, mutual respect and a sense of belonging to the school community. The programme was divided into four main areas: cooperative games, inclusive sports, leadership workshops and guided reflection.

Tabel 1 - Inclusive Physical Education Programme

Areas	**Description of teaching activities**
Cooperative and inclusive games	The first weeks of the programme were devoted to socialisation and cooperative games, with the aim of breaking down barriers between pupils and creating a climate of trust. Among the activities proposed were: • Team games with modified rules, where scoring depended not only on winning but also on cooperation between participants, such as 'multi-touch football' (where each player must touch the ball before scoring) or 'volleyball without elimination' (Spaaij, 2013). • Team-based motor pathways, in which students, divided into groups mixed by ability and cultural background, had to work together to complete physical challenges (Coalter, 2013). • - Activities inspired by Teaching Games for Understanding (TGfU), a method that emphasises understanding the game and the ability to make decisions in a sporting context, rather than just technical execution (Kirk & MacPhail, 2002).
Inclusive and adapted sports	The programme integrated traditional sports with adapted variants to ensure equal participation of all pupils, regardless of their level of sporting ability. Some key activities included: • Rotating Role Football, where each player had to take on a different role during the game (goalkeeper, striker, defender), which

	promoted empathy and awareness of others' difficulties (Shields & Bredemeier, 2009). • Mixed sports tournaments, such as basketball and volleyball, where teams were heterogeneous in terms of ability, gender and nationality, promoting cooperation between students from different backgrounds (García Bengoechea et al., 2017). • Motor problem-solving exercises in which small groups had to solve collective physical challenges, such as carrying heavy objects or overcoming obstacles as a team (Holt et al., 2017).
Leadership workshops and peer tutoring	Shared leadership moments were introduced to develop students' sense of responsibility and active involvement: • Active roles in teams, such as captain, motivator or strategist, which changed on a rotating basis to allow each individual to develop social and team management skills (Fraser-Thomas et al., 2005). • Peer tutoring, in which students with more sporting experience helped peers with difficulties, promoting collaborative learning and reducing inequalities in participation (Smith & Sparkes, 2016). • Role-playing activities in which students simulated sports situations to reflect on the dynamics of fair play, discrimination and inclusion (Donnelly & Coakley, 2002).
Discussion and guided reflection	A central aspect of the intervention was the inclusion of moments of reflection after the sports activities, in which students analysed their own experiences and group dynamics: • Post-activity debriefings with guided discussions on topics such as the importance of working together, overcoming cultural barriers and accepting differences (Schulenkorf, 2012). • Meetings with athletes and inspirational figures who shared experiences related to inclusion in sport, stimulating discussion and debate (Côté & Fraser-Thomas, 2007).

Results

- *Quantitative results analysis*

The analysis of the quantitative data made it possible to assess the impact of the innovative sports programme on school inclusion and students' sense of belonging. In order to obtain a clear picture of the effects of the intervention, standardised questionnaires were administered to both the sample group that participated in the innovative programme and the control group that followed the traditional physical education curriculum. The statistical analysis, carried out using SPSS software, made it possible to compare the pre- and post-intervention results, using significance tests to determine the significance of the observed changes.

The results showed significant differences between the two groups. In the control group, the changes recorded were minimal: the sense of belonging increased by only 2 per cent, while the perception of inclusive processes showed an increase of 1.5 per cent, suggesting that the traditional PE model did not have a significant impact on school inclusion. In contrast, the sample group involved in the innovative programme reported significant improvements. The sense of belonging increased by 15%, signalling greater involvement and identification with the school community. Perceptions of inclusive processes also increased by 12 per cent, highlighting how the approach adopted encouraged more active participation and better integration of pupils.

The comparative analysis between the two groups confirmed the statistical significance of these differences ($p < 0.05$), demonstrating that the innovative sports programme had a positive impact on perceptions of inclusion and the building of a more cohesive environment. These findings are consistent with a number of studies that highlight the central role of sport in developing inclusive and participatory school environments. According to Bailey (2006), sporting activities promote the social and emotional well-being of pupils by creating opportunities for interaction and strengthening bonds with peers. Eime et al (2013) also highlighted how sports participation improves social inclusion, developing a sense of community and cohesion among students. Previous studies, such as those by Fraser-Thomas, Côté and Deakin (2005), confirm that well-structured physical activity programmes promote the development of social and interpersonal skills, helping to create a more equitable and welcoming school environment.

Other research has shown that physical activity plays a key role in fostering a sense of belonging. Goodenow (1993) pointed out that involvement in shared activities increases perceptions of social peer support, while Smith and Sparkes (2016) emphasised that sport can be an effective

tool to promote the empowerment and inclusion of students with social difficulties or disabilities. The approach taken in this study also fits with the inclusive education perspective proposed by Booth and Ainscow (2011), who emphasise that active participation is an essential element in ensuring equitable and accessible learning for all students.

- *Qualitative data analysis*

Analysis of the qualitative data, conducted using MAXQDA software, made it possible to identify recurring patterns in students' and teachers' perceptions regarding the role of sport in school inclusion. The data revealed significant differences between the sample and control groups, both in terms of active participation and perceptions of the school community.

Pupils in the sample group showed a greater sense of belonging and a stronger connection with their peers: "Team activities helped me to get to know my peers better and to feel more accepted"(pupil, 13 years old). The inclusive physical education model favoured the creation of bonds, especially between pupils from different cultural backgrounds, as confirmed by a pupil of foreign origin: "Before, I felt a bit isolated, but now, thanks to sport, I have more friends and I feel part of the class". This confirms Eime et al.'s (2013) claim that sport facilitates the building of positive relationships in heterogeneous school contexts.

On the other hand, pupils in the control group reported more fragmented experiences: "We play together, but in the end everyone thinks for themselves and the best ones rule" (student, 12 years old). This reflects the limitations of a competitive approach which, as Shields and Bredemeier (2009) point out, can accentuate inequalities and limit inclusion. Teachers also observed a significant difference between the two groups: "In the group that followed the innovative programme, I noticed more cooperation and fewer episodes of exclusion" (PE teacher). Similarly, a humanities teacher emphasised the value of the collaborative methodology: "Working together in sport improved classroom dynamics even during lessons", in line with Bailey's (2006) findings on the link between sporting activity and school well-being. Another theme that emerged was the perception of peer support. Students in the sample group reported an increase in mutual help: "When we play sports as a team, we help each other and no one is left behind" (student, age 14). This finding is in line with studies by Fraser-Thomas et al. (2005), which highlighted the role of sport in promoting empathy and cooperation. In contrast, a more competitive dynamic was found in the control group: "Whoever is better plays, the others watch" (pupil, 13 years old), confirming what Donnelly and Coakley (2002) pointed out about the critical nature of an exclusively performance-oriented approach to sport.

The qualitative analysis also highlighted the importance of moments of structured reflection. Students in the sample group appreciated the debriefing after the activity: “Talking about how we felt after the game made us better understand the value of working together. This echoes Schulenkorf’s (2012) research on the importance of reflection in building inclusive communities through sport. Teachers also confirmed the effectiveness of this approach: 'Devoting time to discussion made students more aware of the importance of inclusion”.

Finally, foreign pupils reported an improvement in their school integration: “I can talk more with my classmates now and I feel more comfortable”. This finding is consistent with Coalter’s (2013) findings that inclusive sports activities promote active participation and a sense of belonging.

Discussion

The results obtained confirm the central role of sport in promoting school inclusion and a sense of belonging to the educational community. The significant increase in perceptions of inclusion among students in the sample group highlights how an approach based on cooperation and adaptive motor activities can foster stronger relationships between peers, reducing phenomena of exclusion and social isolation (Eime et al., 2013). This is in line with pedagogical theories of cooperative learning, which suggest that working together in structured contexts promotes active participation and strengthens mutual support among students (Fraser-Thomas et al., 2005; Slavin, 2014). In particular, the cooperative approach in sport allows individual differences to be valued and transformed into useful resources for developing collective skills and strengthening bonds of trust (Johnson & Johnson, 2009). Social integration through the practice of sport was particularly important for students of foreign origin, who reported a greater sense of belonging than the control group. Indeed, physical activity facilitated the overcoming of language and cultural barriers and created opportunities for interaction that would otherwise be difficult to achieve in a purely academic context (Coalter, 2013; Jeanes & Magee, 2012). This finding is consistent with the assumptions of Putnam's (2000) theory of social capital, according to which experiences of collective participation and positive interactions with peers contribute to the construction of support networks that are crucial for social integration. Furthermore, the inclusive dimension of sport emphasised by the programme enabled the competences of all pupils to be recognised and valued, regardless of their level of sporting

ability, in line with Booth and Ainscow's (2011) principles of inclusive education. A key element that emerged from the qualitative analysis was the importance of structured reflection after sports activities. Debriefing stimulated students' awareness of the importance of collaboration and mutual respect, which helped to strengthen the effectiveness of the educational intervention (García Bengoechea et al., 2017; Schulenkorf, 2012). This approach, based on the development of social-emotional competences, finds further support in the literature, which highlights how reflection and self-evaluation are fundamental to increasing personal responsibility and sensitivity towards the group (Hellison, 2011). Indeed, moments of sharing and confrontation help students to internalise the values of fair play, empathy and mutual support, in line with Wenger's (1998) community pedagogy perspective. On the other hand, despite performing the same number of hours of motor activity, the control group did not show significant improvements in terms of perceived inclusion and sense of belonging. This evidence suggests that simply playing sport, if not structured with inclusion in mind, is not sufficient to promote positive relationships among students (Bailey, 2006). Previous studies, such as those by Shields and Bredemeier (2009) and Donnelly and Coakley (2002), show how a predominantly competitive or performance-based approach can sometimes exacerbate inequalities and create exclusionary dynamics between students of different abilities or cultural backgrounds. In contrast, models such as Siedentop's Sport Education Model (1994) show how structuring roles and responsibilities within a 'league' or collaborative sports project can develop a greater sense of belonging and participation. Teachers interviewed during the qualitative analysis highlighted how the innovative programme improved the overall school climate and fostered a more collaborative environment, even outside of PE lessons (Holt et al., 2017). The opportunity to take an active role, such as peer tutoring, encouraged students to develop leadership skills, personal responsibility and respect for diversity, characteristics that are recognised in the literature as fundamental to the success of inclusive education policies (Bean & Forneris, 2017; Donnelly & Coakley, 2002). Overall, the data collected supports the idea that sport, when designed and implemented in an intentional and inclusive way, can be an effective tool for building more cohesive and sustainable school communities, in line with the goals of the United Nations 2030 Agenda (UN, 2015). The convergence of quantitative and qualitative evidence reinforces the validity of the conclusions, highlighting how collaborative sporting activities adapted to the needs of all students can promote equality of opportunity, improve psychophysical wellbeing and stimulate relational skills that are fundamental to active citizenship (Siedentop, 1994; World Health Organization, 2018).

Conclusions and implications

The results of this study confirm that sport can be a powerful tool for promoting social inclusion and sustainability within the school environment. The adoption of an educational approach based on cooperation and the development of interpersonal skills has been shown to foster a greater sense of belonging among students, contributing to the building of a more cohesive and participatory community (Eime et al., 2013). These findings are in line with the Sustainable Development Goals of the UN 2030 Agenda, particularly Goal 4 (Quality Education), which aims to ensure equal learning opportunities and reduce barriers to school participation (UNESCO, 2020).

The increase in perceptions of inclusion among the students in the sample group highlights how inclusive structured sport can contribute to the reduction of educational inequalities, consistent with Goal 10 (Reduce Inequalities) of the 2030 Agenda (Coalter, 2013). In particular, experience has shown that cooperative physical activities and adapted team games can facilitate the integration of students from different socio-cultural backgrounds, thus reducing phenomena of marginalisation and isolation (Schulenkorf, 2012).

Another important aspect that emerged from the study is the role of sport in promoting the mental and physical wellbeing of students, supporting Goal 3 (Health and Wellbeing) of Agenda 2030 (World Health Organization, 2018). Students involved in the innovative programme showed greater active participation and more positive attitudes towards peer relationships, confirming the value of sporting activity as a means of building self-confidence and improving the quality of school life (Bailey, 2006).

From the point of view of educational implications, the study suggests the need to integrate sport methodologies based on cooperation and inclusion into school curricula, rather than a traditional competitive model. In addition to fostering the development of students' social and relational skills, this approach can contribute to building more sustainable and participatory school environments, in line with Goal 11 (Sustainable Cities and Communities), which promotes the creation of inclusive and accessible spaces for all (Spaaij, 2013).

Finally, evidence suggests that educational institutions should invest in teacher training programmes to promote the use of sport as a pedagogical tool for social inclusion. Adopting an educational model that values physical activity experiences as tools for learning and personal growth could be a significant step towards a more equitable, inclusive and sustainable school system (Donnelly & Coakley, 2002).

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Outdoor sports as a tool for environmental sustainability: An educational model for schools and communities

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Abstract

The rising importance of responsible environmental behaviour requires educational approaches that integrate sustainability into daily practices. Outdoor physical education combines sports activities with contact with nature, offering an effective way to foster ecological awareness and promote sustainability. These practices not only improve individuals' psychophysical wellbeing but also develop sense of responsibility toward the environment. This article aims to examine the state of the art on the benefits of outdoor physical education, emphasising its role in encouraging eco-responsible behaviours and supporting sustainability. It also explores how outdoor learning environments can provide valuable insights for future developments in educational practices aimed at sustainability.
Keywords: Outdoor Education, Physical Education, Eco sustainability, Wellbeing

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1. Introduction

The concept of Outdoor Education has acquired a very important role in educational contexts in recent years due to its ability to promote the development of several skills such as motor, cognitive, social and environmental ones, through experiential learning within natural settings.

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This approach falls perfectly in line with the objectives of the United Nations 2030 Agenda, which set the goal of building a more sustainable and inclusive world through a framework of global targets. In particular, Outdoor Education concretely responds to Goal 4, which promotes quality education, Goal 10, which aims to reduce inequality, and Goal 11, which aims to encourage the creation of sustainable communities and cities (Bexell & and Jönsson, 2017).

Outdoor Education is an innovative educational modality involving a form of active learning, and in particular this form of learning takes place through outdoor educational activities. This process has numerous positive effects in stimulating their curiosity in learning new knowledge, improves students' problem solving and teamwork skills(Mackenzie et al., 2018). Numerous studies have shown that this approach not only promotes physical and mental well-being, but also strengthens social bonds and increases environmental awareness(Hartig et al., 2011; Pirchio et al., 2021).

One of the most interesting aspects of outdoor education is its natural alignment with physical activity. Physical experiences in nature not only enhance physical health, but also contribute to cognitive development, improving executive functions and promoting social inclusion(Fromel et al., 2017; Pomfret et al., 2023; Sutton & Wheatley, 2003). Activities such as hiking, orienteering, cycling and any other outdoor sport invite individuals of all backgrounds and abilities to actively participate and collaborate with each other (Leeder & Beaumont, 2025). Indeed, a further central aspect of outdoor activities is their ability to be designed and adapted to the needs and abilities of each individual, thus laying the foundations for authentic social inclusion. Indeed, adapted sports programs, such as accessible trekking or climbing for persons with disabilities, have been shown to improve not only the motor skills of participants, but also their sense of belonging and self-esteem(Hamilton et al., 2023; Isidoro-Cabañas et al., 2023; Warren & Breunig, 2019).

Furthermore, it has been shown that an individual, when in contact with nature, reduces stress and anxiety levels, and increases motivation, thus making the learning process more immediate and accessible (Bento & Dias, 2017).

For this reason, the inclusion of outdoor education programmes within school curricula represents a concrete opportunity to enrich students' learning experience and make learning more dynamic. Traditional education, often limited to closed spaces and frontal methods, can benefit from the integration of outdoor activities, which stimulate active involvement, 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 in a single experiential context (Neville et al., 2023).

A further central element of outdoor education and outdoor sports is their ability to raise awareness among individuals and students 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 behaviour. Numerous studies have shown that experiential learning in natural environments strengthens environmental awareness and stimulates the adoption of sustainable practices, such as waste reduction, responsible use of resources and active mobility (Chawla, 2020; Rickinson et al., 2004).

The aim of this work was therefore to analyse the role of Outdoor Education in the field of physical education and school training, with particular attention to its ability to promote greater environmental awareness and to encourage sustainable behaviour. The main objective is to investigate how outdoor experiential learning can stimulate in students a more direct relationship with the environment, encouraging attitudes of respect and care for the planet, as well as contributing to their psychophysical wellbeing and the development of motor, cognitive and social skills.

A central aspect of this analysis concerns the potential of Outdoor Education in forming more ecologically aware citizens, through concrete experiences that allow them to understand the importance of biodiversity, the management of natural resources and the reduction of environmental impact. Living and learning outdoors helps students develop a sense of responsibility towards the environment, prompting them to integrate sustainable practices such as waste reduction, active mobility and respect for ecosystems into their daily lives.

2. The positive effect of Outdoor Sports

Outdoor sports encompass a wide range of sporting activities that are performed in natural environments, including cycling, boating, hiking, climbing, orienteering, skiing and surfing, and so on.

The prevalence of outdoor physical activity varies widely between countries depending on geographical, economic and cultural factors. The Scandinavian countries, for example, are among the countries that most promote outdoor sports activities. The Scandinavian countries, for example, are among those that most promote outdoor sports activities. In these

countries, *friluftsliv*, a philosophy of life, is well known. It is a complex philosophical concept, which only exists in Scandinavia, and means 'life in the open air', essentially indicating a lifestyle in contact with nature (Gelter, 1999).

In North America, the wide availability of national parks and protected areas has favoured the growth of sports such as rafting, mountain biking and climbing (Cordell, 2012). Even in Australia and New Zealand, countries with a wide variety of ecosystems, outdoor sports are widely practised, with a focus on water sports such as surfing. In contrast, in countries with a high urban density, such as Japan or South Korea, the availability of open, natural spaces is limited and high outdoor temperatures, often exacerbated by the urban heat island phenomenon, can reduce opportunities for outdoor physical activity. However, in recent years, efforts have increased to create green spaces and infrastructures that encourage outdoor physical activity, seeking to mitigate the negative effects of climate change and improve the quality of the urban environment (Asano et al., 2022).

Fortunately, many other countries, as well as Japan and South Korea, are taking action to counter this limitation. They are investing in the creation of infrastructures and natural spaces to encourage the practice of outdoor physical activities, as well as incorporating and approving projects within educational contexts for many reasons.

It is now widely known that sport in general (i.e. outdoor or indoor) offers numerous physical health benefits, improving general fitness and preventing chronic diseases(Agarwal, 2012; Zureigat et al., 2024). With regard to outdoor sports in particular, scientific studies have shown that the regular practice of outdoor activities improves cardiovascular health and reduces the risk of hypertension and heart disease (Poli et al., 2025). Outdoor physical activity, as well as indoor ones, also helps in controlling body weight and preventing type 2 diabetes due to the combination of aerobic exercise and increased energy expenditure. In addition, movement in natural environments strengthens the immune system and the musculoskeletal system, helping to reduce the risk of osteoporosis and fractures, as exposure to nature and sunlight boosts vitamin D production and improves the immune system (Kil & Yang, 2012).

In addition to the physical benefits, which we can consider fairly equivalent to indoor sports, outdoor sports have a positive impact on mental health. Exercise in contact with nature has been associated with a reduction in stress and anxiety levels, with measurable effects on reducing cortisol production(Bratman et al., 2012). It also stimulates the release of endorphins and serotonin, improving mood and reducing symptoms of anxiety and depression (Maas et al., 2009; Pretty et al., 2005; White et al., 2019). Studies

have shown that exposure to natural landscapes and physical activity combined improve concentration and memory, contributing to the development and enhancement of executive functions (Berman et al., 2008). In addition, the regular practice of outdoor sports has been associated with improved sleep quality and emotional regulation, which are key aspects of overall well-being (Bowler et al., 2010).

3. Outdoor Sports and Awareness for Sustainability

Practising outdoor sports is not only a way to stay physically active and have better physical and mental wellbeing (Matos et al., 2017), but also represents a vital platform to promote ecological awareness and commitment to environmental sustainability (Louv, 2005). This is an issue that has become increasingly relevant in the current global context, in which climate change, with its devastating impacts on the environment, calls for an urgent need to adopt responsible behaviour and to sensitise new generations towards the preservation of our planet. In this perspective, through participation in outdoor activities, students have the opportunity to immerse themselves in natural environments, developing a deep connection with nature. This direct contact stimulates a greater understanding of biodiversity and the fragile ecological balances that mark our ecosystems. Indeed, recent studies have shown that regular exposure to natural landscapes not only improves psychological well-being, but also increases empathy towards living beings, fostering inclusion and acceptance of diversity, and the desire to protect the environment (Gladwell et al., 2013).

In the global context in which we live, increasingly characterised by climate and environmental challenges, it is crucial that new generations understand the importance of responsible consumption and resource conservation. And as we have just reported, the practice of outdoor sports offers a unique opportunity to build ecological awareness, encouraging young people to become responsible citizens committed to environmental protection. Activities such as forest orienteering, trekking in protected areas, climbing on local cliffs or rafting in clean rivers not only stimulate an interest in adventure, but also educate individuals of all age groups on the sustainable management of resources, the importance of biodiversity and the need to minimise human impact on the environment(Messina et al., 2015; Salazar et al., 2024).

Consequently, it is essential to provide educational contexts that support this awareness. It is therefore equally important to consider that the new generations need educational venues that make them aware of this

topic(Børresen et al., 2023). Therefore, it is crucial to recognise that new generations require educational spaces that raise awareness about environmental sustainability. Considering the points discussed so far, it becomes clear that outdoor educational activities, combined with physical activities and sports in natural environments, are key elements in fostering an understanding of environmental sustainability among younger generations.

Furthermore, shared experiences in nature through outdoor sports create a sense of community and a collective commitment to sustainability. Groups of students practising outdoor sports together develop a collaborative mindset, encouraging discussions on ecological issues and joint actions to address environmental challenges. The networks and social connections created through these experiences can encourage young people to undertake ecological initiatives outside the school environment as well, such as participating in environmental volunteering projects or supporting awareness-raising campaigns (Sandford et al., 2008).

4. Inclusion of Outdoor Sports in Educational Setting

Based to what has been reported so far, the importance of including outdoor motor and sports activities in educational settings is clear. The inclusion of outdoor sports in the physical education curricula represents a fundamental educational strategy that goes beyond the simple traditional approach, offering a viable alternative to conventional teaching practices.

By supplementing the traditional teaching approach with motor activity outdoors and in contact with nature, schools not only enrich the learning experience, but also promote holistic development in students.

Outdoor sports encourage active, hands-on learning, where students are not mere receivers of information, but become active participants in their own educational process. This mode of learning enables the development not only of physical skills, but also of social, cognitive and transversal skills, such as resilience, leadership and risk management, all of which are essential for personal growth.

Outdoor activities foster socialisation and the building of interpersonal bonds, as they frequently require teamwork, communication and cooperation. This is particularly relevant in classes where students may come from different cultural and socio-economic backgrounds. Shared experience in a natural setting facilitates inclusion, allowing each pupil to contribute his or her unique abilities, fostering a culture of empathy and mutual support.

In addition, the teaching of outdoor sports also offers an important opportunity for the integration of theory with practice. Schools can develop interdisciplinary projects that link physical education with natural sciences, environmental education and even art education. For example, while students practice orienteering, they can learn to read maps, understand local ecosystems and discuss the importance of environmental conservation. In addition, nature itself becomes an exploratory laboratory: students can observe the effects of weather and climate conditions on fauna and flora, thus integrating theoretical knowledge with practical experience. The inclusion of activities outside the traditional classroom helps to break the monotony of the education system by incorporating what are termed 'active breaks', which are essential for young students to break the sedentary nature of the classroom and improve concentration for the next lesson.

The integration of outdoor sports into school curricula also has positive long-term effects, encouraging students to maintain an active and healthy lifestyle by continuing outdoor activities even after they leave school.

To ensure that the integration of outdoor sports is effective, it is crucial that schools adequately train their teaching staff to develop structured programmes that optimise the benefits of these outdoor experiences. Investment must be made in the training, resources and infrastructure that support these initiatives. Only in this way will education systems be able to reap the full benefits of outdoor sports, fostering a more active, competent and aware generation of students.

Indeed, recent studies has shown that the specific preparation of teachers in outdoor methodologies significantly improves their self-efficacy and competence in integrating such activities into the school curriculum, ensuring more structured and safe experiences for students(Dyment & Potter, 2015).

One of the key aspects of training is learning teaching strategies that foster an interdisciplinary approach, combining physical education with other disciplines, such as environmental science and sustainability education (Quay et al., 2020). Properly trained teachers are able to exploit natural environments as learning laboratories, offering students immersive experiences that facilitate the link between theory and practice.

Conclusions

In conclusion, this literature analysis shows that outdoor education and outdoor sports are fundamental as educational strategies for enhancing experiential learning and the holistic development of students. This approach

not only promotes motor, cognitive and social skills, but also instils a deep environmental awareness, helping to form more ecologically responsible citizens.

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

Therefore, it is essential that educational institutions recognise the importance of these programmes and invest in the training of teachers and the creation of adequate infrastructure. Only in this way will it be possible to maximise the benefits of Outdoor Education and ensure that students not only acquire knowledge and skills but also develop a sense of responsibility towards the environment around them. In a global context where environmental challenges are increasingly pressing, the adoption of teaching methodologies incorporating Outdoor Education represents a decisive step towards a sustainable and inclusive future.

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Sustainability and eco-anxiety: Strategies for addressing environmental concern

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Abstract

Although there is still no unanimous definition of eco-anxiety, this term is used to describe an emerging phenomenon which, in recent years, has attracted the attention of psychologists, sociologists and those involved in Public Health. It refers to a form of anxiety and worry related to climate change and for the future of the planet and its resources. This article explores how eco-anxiety can influence environmental awareness and sustainability practices, highlighting both challenges and opportunities it presents for promoting a sustainable future.
While these feelings towards the environment and climate change can generate anxiety, it can also act as a powerful driver of change and awareness in promoting sustainability. Therefore, it is crucial to develop strategies that transform eco-anxiety into positive action, supporting individuals, particularly more vulnerable, in their transition to more sustainable practices.
Keywords: climate change, concern, eco-anxiety, environment, sustainability

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1. Introduction

In recent decades, climate change is a topic that's getting a lot of attention in various contexts; moreover, the increasing recurrence of extreme climatic events may have led to the modification of habits among populations that face and suffer them. These can be seen as incentives and disincentives that

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impact on the choices of certain groups of the population, influencing them and their health. There is an increasing number of scientific evidence on the negative effects that the current climate change is having on the individuals' health, especially among those who already have particular health conditions. Indeed, the ongoing climate crisis is not just caused harm to environment, but it is also having deep psychological effects on people worldwide. The health risks caused by climate change are largely linked to the direct effects of the anomalous heat recorded in the increasingly frequent heat waves worldwide, but also to the disastrous events related with climate change that impact the places in which we live.

The data currently available highlight the need for urgent actions involving different sectors. Public health systems, including the Italian one, are progressively adopting strategies to strengthen their surveillance and response systems to climate emergency.

The effects of climate change reach far beyond just harming the environment, since they have a direct impact on public health in both the short and long term; as temperatures increase, extreme weather events become more common, it could determine the spread of vector-borne diseases like malaria and dengue, and additionally, worsening air pollution and heat stress can lead to more respiratory and cardiovascular issues (World Health Organization, 2021). Moreover, climate-related food and water shortages raise the risk of malnutrition and waterborne diseases, particularly among vulnerable population. Finally, the mental health effects of climate change also add to the overall burden of disease, highlighting the urgent need for health systems that can support climate challenges and respond to psychological needs (Watts et al., 2021).

Therefore, public health organizations are increasingly urged to weave climate adaptation into their health policies, enhancing early warning systems, emergency preparedness, and community prevention efforts, for the safeguard of public health which becomes closely linked from the promotion of climate action and sustainability.

In Europe, Italy stands out as one of the most climate-vulnerable country, frequently facing extreme weather events like floods, droughts, and wildfires (ISPRA, 2023). These challenges have a significant impact on communities, agriculture and infrastructure, and causing both economic and psychological strain for those living there. (Cogo et al., 2021).

Climate Activism and movements such as "Fridays for Future" have rallied thousands of young Italians, sparking awareness and igniting a great attention on protection of the planet (Martiskainen et al., 2020). This increase in young participation demonstrates the influence of young voices on

shaping public discussions and policies, and also highlights the link between anxiety and proactive environmental leadership.

In this scenario, sustainability plays a fundamental role; managing responsibly our natural resources, to meet our present requirements, without endangering the ability of future generations to meet theirs own, it is a crucial notion when it comes to addressing the environmental issues we confront on a daily basis. Energy conservation, waste reduction, climate adaption, and the advancement of circular economies are only a few of the many diverse topics covered by sustainable practices (United Nations, 2023). Sustainable practices can improve social and economic well-being and reduce environmental impact in our daily lives.

Given climate change and the associated eco-anxiety, the pursuit of sustainability is particularly important. Research, show that people who take part in sustainable activities report feeling more environmentally effective, which can lessen the hopelessness that frequently accompanies eco-anxiety (Pihkala, 2020; Sampaio et al., 2023). Furthermore, community-based projects and sustainability education are essential for increasing environmental consciousness and enabling people to act as change agents; therefore, these issues should be incorporate into our government policies, business plans, and educational institutions.

According to the Intergovernmental Panel on Climate Change (IPCC), global temperatures have increased about 1.1°C above pre-industrial levels, with serious effects not only for ecosystems but also to human societies (IPCC, 2023). All extreme weather events such as heatwaves, droughts, floods, landslides, and fires happening more often and with greater intensity, determining effects on food security, water availability, and in general on public health (World Health Organization, 2021). Moreover, the World Health Organization (WHO) projects that climate change could lead to around 250,000 extra deaths each year between 2030 and 2050, due to issues like malnutrition, malaria, diarrhea, and heat stress (WHO, 2021).

These environmental changes also could consequences on mental health. Indeed, lately the term eco-anxiety is increasingly used, to describe a feeling of fear and worry from climate change (Clayton, 2020). It refers to a form of anxiety and worry related to climate change and for the future of the planet and its resources. This concern has been gaining more attention, particularly among younger generations who often feel both at risk from climate impacts (Hickman et al., 2021). Sometimes eco-anxiety can inspire people to take action for the environment, but, at same time, it can also lead to psychological distress if individuals feel overwhelmed by the threat of climate change (Boluda-Verdú et al., 2022). This article explores how eco-anxiety can influence environmental awareness and sustainability practices,

highlighting both challenges and opportunities it presents for promoting a sustainable future, and how integrated approaches – governments, communities, and schools – can build both environmental and psychological resilience.

2. Eco-anxiety: definition and dimensions

Despite the lack of a universally accepted definition, eco-anxiety has gained popularity as a term to characterize a new and complex phenomenon, that has recently attracted the attention of public health professionals, psychologists, and sociologists (Clayton, 2020; Pihkala, 2020). Initially, eco-anxiety was primarily thought to be a worry associated with climate change, but nowit may also cause people to feel depressed, guilty, or anxious about the future (Clayton & Karazsia, 2020). Indeed, scientists have also highlighted its socio-political aspect, acknowledging that economic interests and the perceived inability of political leaders to adequately address the climate crisis sometimes intensify this phenomenon (Hickman et al., 2021). Interdisciplinary research has been prompted by this changing understanding, with contributions from environmental sociology, political ecology, and public health (Ojala, 2016; Pihkala, 2020). The need of climate-resilient health systems that can address the effects of environmental change on both physical and mental health is highlighted by the growing recognition of eco-anxiety in the area of public health as a component of a larger framework of climate-related health impacts (WHO, 2021).

According to research, eco-anxiety is frequently linked to mental health symptoms like anxiety, sadness,and insomnia (Boluda-Verdú et al., 2022); among adolescents and young adults, it has been associated with a higher incidence of suicidal thoughts especially in those who are already dealing with mental health issues (Lerolle et al., 2025). Additionally, when people believe that climate change is unavoidable and unpredictable, eco-anxiety can cause them to become emotionally paralyzed (von Gal et al., 2024).

However, there is strong evidence that pro-environmental action, such as climate activism, consuming less, and adopting an environmentally conscious lifestyle, is positively correlated with eco-anxiety (Ogunbode et al., 2022). This supports the idea that eco-anxiety is context-dependent and impacted by societal norms, perceived efficacy, and government action (Hickman et al., 2021). When people believe that their individual efforts are in vain, eco-anxiety can become worrying. Avoidance behaviors, disengagement from the environmental discourse and, finally, a decline in psychological well-being can result from this feeling of eco-paralysis. The

significance of providing structured pathways from awareness to action is underscored, as it ensures that concerns are transformed into meaningful and feasible engagement.

3. The role of sustainability in managing eco-anxiety

When properly presented, sustainability initiatives can empower people, encouraging significant action. Particularly important in converting eco-anxiety into constructive participation through community initiatives that promote collaborative environmental action, build a connection with nature, and integrate creative expression (Thomson et al., 2025). In particular, projects that prioritize concrete and local environmental improvements, provide people a sense of efficacy by showing how simple initiatives can lead to bigger solutions. This approach fosters a feeling of community and shared responsibility, reinforcing the concept that environmental stewardship begins within communities. Moreover, programs that prioritize intergenerational collaboration cultivate a feeling of continuity and optimism, which are essential elements in combating hopelessness associated with climate uncertainty.

In the literature, people who have a high level of collective effectiveness, the belief that their governments and communities can effectively tackle climate change has had less eco-anxiety (Hickman et al., 2021). On the other hand, the perception of government inactivity tends to increase eco-anxiety, especially among young people who believe that their future is neglected (Hickman et al., 2021). This underlines how crucial it is to combine responses at individual, community and political levels to ensure that environmental concerns are addressed in practice.

4. Strategies for addressing eco-anxiety

Educational programs need to shift their focus away from alarming narratives and towards solution-oriented thinking. Research on nursing students demonstrates that eco-anxiety and climate change awareness are related, but it also emphasizes how critical it is to give students the tools they need to participate in mitigation and adaptation initiatives (Baykara Mat & Yilmaz, 2024). In order to assist people place their worries within larger systemic issues and find concrete chances for action, climate literacy initiatives should prioritize both scientific information and psychological coping abilities (Sampaio et al., 2023).

It is essential to incorporate eco-anxiety into mental health treatment, especially for young people and disadvantaged groups. Climate-aware treatment can assist people in processing their feelings without repressing them, and eco-anxiety should be acknowledged as a real worry (Boluda-Verdú et al., 2022). Promising therapeutic approaches include eco-emotion control techniques and acceptance and commitment therapy (Pihkala, 2020). Furthermore, group-based therapies that integrate collective action planning with emotional expression have been successful in promoting environmental agency and psychological resilience.

Anxiety can be transformed into action by making more accessible possibilities, such climate activism, community, or environmental volunteer work (Sampaio et al., 2023). Research indicates that peer-led programs work especially well with young people, who find comfort in group efforts and approval from others (Ogunbode et al., 2022).

Programmes that promote connection with nature and creative expression, such as eco-art therapy or nature immersion experiences, can alleviate discomfort by strengthening emotional bonds with the environment (Thomson et al., 2025). Such programs help individuals redefine their relationship with nature from one of fear and loss to one of care and reciprocity. Creative interventions also allow the symbolic elaboration of eco-anxiety, allowing a constructive emotional expression.

Finally, governments and institutions need to recognize that transparency and responsiveness are key to reducing eco-anxiety. Young people who perceive their governments as a crucial climate action report less ecological anxiety and greater confidence in democratic processes (Hickman et al., 2021). Policies that actively involve young people in climate decision-making, combined with clear climate action plans, can restore confidence and reduce negative feelings (Hickman et al., 2021). The Italian government and local institutions have introduced several climate policies, including incentives for renewable energy, green infrastructure projects and emission reduction targets (ISPRA, 2023). However, the implementation of these policies is often difficult.

Schools play a crucial role in forming young people's understanding of climate change and in improving their ability to respond to environmental challenges. Recent studies show that integrating environmental education into curricula not only improves climate literacy, but also provides students with the emotional tools to process eco-anxiety (Ojala, 2016). Effective environmental education goes beyond the transmission of facts about climate change; it actively involves students in problem-solving activities, promotes climate communication skills and encourages participatory learning through projects directly linked to local environmental issues (Lawson et al., 2019).

Educational institutions are increasingly incorporating climate action projects, where students collaborate on sustainability initiatives within their schools and communities. Such experiential learning improves self-efficacy-a key protective factor against eco-anxiety-and reinforces the belief that personal and collective actions can drive positive environmental change (Stevenson et al., 2021). In addition, interdisciplinary approaches combining science, ethics and psychology help students grasp both the ecological and emotional dimensions of climate change, making them better equipped to deal with uncertainty and stress (Rousell & Cutter-Mackenzie-Knowles, 2020).

The inclusion of environmental education at all levels of education, from primary schools to universities, is increasingly seen as a vital climate adaptation strategy, which increase climate resilience and empowers future generations to become agents of sustainable change.

Being well informed about environmental problems and available solutions can significantly reduce feelings of impotence and promote a pro-active mindset. Access to reliable information enhances individuals' sense of autonomy and encourages constructive engagement, turning fear into informed action (Ojala, 2016; Lawson et al., 2019).

Environmental education through reliable media sources, educational campaigns and digital platforms can bridge the gap between climate science and public understanding (Lawson et al., 2019). When individuals receive concrete information on how they can contribute to adaptation efforts, they are more likely to adopt sustainable behaviors and engage in collective action (Stevenson et al., 2021). In addition, promoting critical media literacy helps young people assess the accuracy of climate-related content, countering misinformation that can exacerbate eco-anxiety (Rousell & Cutter-Mackenzie-Knowles, 2020).

According to literature, stories that provide hope and answers rather than just difficult situations are crucial for empowering people rather than immobilizing them (Ojala, 2016). Positive social norms and the belief that change is achievable can be promoted by presenting real examples of successful environmental activities. The combination of knowledge, action and optimism promotes a sense of control and purpose in addressing climate concerns by converting eco-anxiety into eco-effectiveness.

5. Interconnection between eco-anxiety and sustainability

Eco-anxiety and sustainability are closely related. On the one hand, the experience of eco-anxiety can encourage people to adopt more

environmentally friendly habits (Clayton, 2020), people can alleviate feelings of powerlessness by taking practical steps to restore their sense of effectiveness and control (Ojala, 2016); however, excessive eco-anxiety can lead to environmental paralysis, a condition in which people completely stop worrying about environmental concerns because they believe that their efforts are useless due to systemic inaction (Boluda-Verdú et al., 2022). These aspects underline how crucial it is to provide unambiguous channels for positive interaction, in order to ensure that eco-anxiety will motivate action rather than prevention.

Community involvement and social support networks play a crucial role in transforming eco-anxiety into collective empowerment. Studies indicate that participation in community sustainability projects helps people feel supported and part of a broader movement, against climate-related challenges (Sampaio et al., 2023). Social connections promote shared responsibility, validate environmental concerns and provide practical avenues for collaborative action, strengthening both psychological resilience and environmental commitment (Thomson et al., 2025).

Education is a powerful mediator between eco-anxiety and sustainability. Educational programmes that empower rather than alarm students have been shown to reduce climate distress by promoting pro-environmental behaviour (Lawson et al., 2019). Effective environmental education combines health literacy, critical thinking and emotional coping skills, enabling students to understand complex climate issues, with optimism (Ojala, 2016). Educational initiatives that highlight solutions, showcase successful environmental actions and encourage youth participation in climate governance improve both environmental effectiveness and psychological well-being.

6. Conclusion

Eco-anxiety is a growing phenomenon that highlights the deep interconnection between environmental health and the psychological well-being of individuals. To contrast eco-anxiety, systematic environmental activity that considers public concern is required. By integrating climate knowledge with policy reform, societies may turn this feeling into a force for resilience and personal empowerment, for a sustainable and hopeful future. Its increasing prevalence serves as a reminder of the phenomenon's seriousness as well as the potential for revolutionary change with the right approach. People’s experiences and feelings should be taken into consideration when governments and institutions develop environmental

strategies for the future of the planet. This might encourage a collaborative approach that improves a feeling of belonging and shared accountability. Moreover, eco-anxiety may be transformed into a driving factor for resilience and populations self-determination. Education, which encourages individuals to actively engage in sustainability initiatives, can help achieve this objective.

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The importance of making sport sustainable

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Abstract

In the last few decades, climate change has become a real crisis with important consequences on many socioeconomic contexts, such as the sport sector. In fact, sports training and competitions are more and more threatened by extreme weather events and hot temperatures. Since the social and individual benefits of sport are well known, this could lead to further negative consequences. At the same time, sports industry and the other sport-related sectors such as sponsorship, apparel, media, and travel sectors contribute to the environmental crisis. Therefore, substantial changes are needed in this setting, in order to adapt the sport activities to the changing climate and to achieve sustainability.
Keywords: Climate change, Sport, Sustainability, Environment, Society, Community

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Introduction

Climate crisis and sustainability

In the last few decades, climate change has become a real crisis. In 2013-22, the global mean temperature reached 1.14°C above pre-industrial levels, progressively impacting the mental and physical health

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and survival of people worldwide, and projections suggest these risks could worsen in the future (Romanello *et al*. 2023). Each year, thousands of people are killed or affected by extreme temperatures, wildfires, floods and drought which in turn can generate food insecurity and favor the spread of infectious diseases (Pörtner et al., 2023). At the same time, essential infrastructures are also damaged, and socioeconomic conditions of entire populations, especially of the most vulnerable ones, are constantly threatened (Romanello *et al*. 2023).

The evident impact of climate crisis on human life and the increasing awareness that it strictly depends on human activities, the need to undertake effective solutions have been taken in account by several international organizations. In particular, the need for making human activities sustainable in order to improve people and planet health has become essential.

In 1987, the United Nations Brundtland Commission defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987).

In 2015, all United Nations Member States adopted the 2030 Agenda for Sustainable Development, which contains the 17 Sustainable Development Goals (SDGs) that all countries are called to achieve in a global partnership in order to guarantee a prosperous and peaceful future for the worldwide population and for the planet (Table 1) (United Nations, 2015).

Table 1 - UN 2030 Sustainable Development Goals

Goal 1. End poverty in all its forms everywhere
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3. Ensure healthy lives and promote well-being for all at all ages
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5. Achieve gender equality and empower all women and girls
Goal 6. Ensure availability and sustainable management of water and sanitation for all
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10. Reduce inequality within and among countries

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12. Ensure sustainable consumption and production patterns
Goal 13. Take urgent action to combat climate change and its impacts
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Countries from all over the world are currently engaged in meeting these goals, but the increasing threat of climate change make difficult this achievement, especially for the developing ones.

Sport and climate change

Physical activity in all its forms plays an important role for communities: it positively influences health, contributes to social cohesion, and offers employment opportunities to millions of people.

The climate emergency that the global population is currently facing, with an exponential increase in extreme weather events such as floods or heat waves, has inevitable repercussions also in the field of physical activity and sports (Bernard *et al*., 2021).

The relationship between sport and climate is controversial: on the one hand, sports activities produce a high quantity of emissions that contribute to determining climate change, on the other extreme weather events have significant negative effects on competitions, on athletes' health and performance, but also on the levels of physical activity of the populations involved, in particular for some categories such as children and people with chronic conditions (United Nations Department of Economic and Social Affairs, 2022).

The transport of people and supplies linked to major sporting events, the production of sports equipment, the construction of sports facilities and the production of waste related to the competitions have a significant environmental impact. For example, it has been calculated that the 2008 Beijing Olympics produced emissions of 1.2 million tons of CO_2, which

rose to 3.4 million in the 2012 London Olympics and 3.6 million in the 2016 Rio de Janeiro Olympics (Goldblatt *et al*., 2020).

Various factors may contribute to the environmental footprint of the different sports. Some sports activities may imply more intensive resource use, waste generation, and greenhouse gas production than others. For example, motorsports require an intensive consumption of fossil fuels and oils, with consequent emissions of greenhouse gases; golf is practiced in wide portions of land, which are obtained through deforestation and must be maintained through a large use of water and chemicals; winter sports need complex facilities that require considerable energy consumption, even for the production of artificial snow.

On the other hand, the effects of climate change on major sporting events have become evident (Orr *et al*., 2022). The increase in average temperatures and the unpredictability of meteorological phenomena often cause the cancellation or postponement of competitions, with significant consequences for the organizers and clubs, but also for athletes and spectators. In 2018, the devastating fires that occurred in California forced the cancellation of the National Basketball Association basketball matches at the Golden Center in Sacramento. In 2019, Typhoon Hagibis hit Japan, where the Rugby World Cup was taking place. Although the consequences on the competition were limited to the cancellation of some matches and the flooding of some facilities, it is necessary to consider the long-term consequences that this and other similar destructive events can have on sports practice, given the impact they can have on the facilities used for training or matches, but also on amateur practice, when resources useful to the whole population are affected.

With reference to the increase in temperatures, for example, during the 2020 Tokyo Olympics long-distance competitions were moved to Sapporo, due to the stifling heat recorded in the capital, with peaks of 41°C and dozens of deaths from heat stroke. Identifying cities that can host summer championships is in fact becoming increasingly difficult due to the possible exposure of individuals to extreme weather factors, just as the holding of winter events is affected by the lack of snow and ice. It has been estimated that only 10 locations will be able to host winter sports by 2050, and only six by 2080. In addition, the increased degradability of snow due to higher temperatures increases the likelihood of injuries. During the 2014 Sochi Paralympics, for example, the injury rate was six times higher than at the 2010 Vancouver Games.

As for the impact that climate emergency can have on the health of athletes and spectators, in recent years research has focused in particular on the effects of exposure to high temperatures (Bernard *et al*., 2021).

Hyperthermic stress phenomena such as heat stroke or sunstroke are increasingly frequent among athletes, and the association between exposure to high temperatures and lower resistance, greater possibility of making errors during practice and greater aggressiveness in the game has been demonstrated.

Not all athletes are at the same risk of being negatively affected by exposure to high temperatures. For example, endurance athletes are at greater risk due to the high intensity of training and the length of training sessions and competitions. The main factors that determine the likelihood of experiencing heat-related problems include in fact environmental conditions such as temperature and humidity, but also the intensity and duration of exercise, as well as the clothing worn and individual factors such as age, body size and general health (Ebi et al., 2021).

Sport and sustainability

The fundamental role of sport in promoting education, health, development and peace was underlined by the United Nations on 16 October 2014, which encouraged Member States to give sport due consideration in the context of the post-2015 development agenda (United Nations General Assembly, 2014).

Due to its global reach and its universal language, the sport sector, which gathers millions of people, practitioners, and professionals from all ages around the world, has the potential of promoting education, health, development and peace in communities, also engaging socially excluded groups (International Olympic Committee, 2015).

In 2015, the Commonwealth Secretariat made a consultation of sport and development experts to assess how sport can contribute to the achievement of SDGs. Participants identified seven goals and the ways in which sport could act to reach them (The Commonwealth, 2015).

The first goal is "SDG 3: Ensure Healthy Lives and Promote Wellbeing for All, at all Ages". The Commonwealth highlighted the role of sport and physical activity in reducing the risk of developing non-communicable diseases by fighting inactivity, which is responsible for more than 3 million deaths each year and has a notable economic burden. Moreover, sport can convey health messages to several population groups.

The second goal to which sport can contribute is "SDG 4: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All". Sport and physical activity have been recognized as fundamental rights by the International Charter of Physical

Education and Sport. Physical education is an inclusive instrument for the development of physical literacy and other learning outcomes, having positive effects on academic performance of all children.

Furthermore, by promoting gender equality, sport can also contribute to the SDG 5 "Achieve Gender Equality and Empower all Women and Girls".

In addition, the Commonwealth's report underlines the capacity of sport to create job, and then to contribute to the achievement of SDG 8 "Promote Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All".

Finally, it is recognized the role that sport can have in bringing people together and improve societies and cities (SDG 11 "Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable and SDG 16 "Promote Peaceful and Inclusive Societies for Sustainable Development, Provide Access to Justice for All and Build Effective, Accountable and Inclusive Institutions at all Levels"), even through global partnership (Goal 17 "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development").

In 2017, the Sixth International Conference of Ministers and Senior Officials Responsible for Physical Education and Sport held in Kazan, Russia, produced a detailed plan of the ten goals and 36 targets on which sport can have the biggest impact (United Nations Educational, 2017). In addition to the goals highlighted by the Commonwealth, the Kazan Action Plan considered that sport can have a role even in achieving SDG 10 (reducing inequalities), SDG 12 (responsible consumption and production) and SDG 13 (combat climate action).

The United Nations Office on Sport for Development and Peace, instead, assumed that sport may contribute to all the seventeen SDGs: in 2024, the United Nations General Assembly consensus declared "Sport as an Enabler of Sustainable Development" (United Nations General Assembly, 2024).

In particular, a key role in combatting climate change has also been attributed to sport (United Nations Department of Economic and Social Affairs, 2022). The United Nations highlighted that, reaching and influencing millions of people worldwide, sport can increase individuals' education and awareness on climate change. Athletes and teams can serve as role models for planet-saving behaviors to their supporters, especially the young ones. Furthermore, sport is increasingly recognized as a low-cost, high-impact tool to address global warming and reach sustainable development. Finally, reducing sport climate footprint through the

incorporation of sustainability standards in the sport industry can lead to sustainable production and consumption standards in other sectors.

How to make sport sustainable?

In recent years, an increasing number of virtuous initiatives, both public and private, have been adopted at international and national levels (Goldblatt *et al*., 2020).

The effects of climate change on the conduct of competitions can be addressed by choosing suitable locations or adequate planning that takes into account weather and climate factors, or by adopting solutions such as shading and air conditioning systems. However, when identifying such strategies, it is necessary to take into account the possible economic and environmental impacts that they may have and base them on the principle of sustainability. The organizers of the 2022 FIFA World Cup in Qatar, for example, had to face similar challenges, since the interventions aimed at cooling the air in the outdoor facilities entailed significant costs and environmental consequences.

Several sports organizations have started to initiate actions such as reducing their emissions or building new facilities based on cutting-edge standards. Some clubs have also sought to raise awareness of climate issues among their members and fans, inspiring other clubs to follow their model. The US Tennis Association introduced, in 2018, an "extreme heat strategy", to allow players to take periodic breaks in the presence of high temperatures. It is also appropriate that those who practice physical and sports activities are made aware of the problems they may encounter in relation to exposure to extreme weather conditions and educated on the prevention strategies to adopt.

Many organizations and participants are working to implement more sustainable practices, such as the use of renewable energy, responsible waste management and environmental awareness. Improving the sustainability of sports depends to a large extent on the adoption of greener practices at the individual and organizational level.

In Germany, for example, the Bayer Leverkusen football club has drastically reduced the use of single-use plastics, employ renewable energy for its activities and well water for irrigation; in Great Britain, the England's Forest Green Rovers football club uses exclusively clean energy and recycles rainwater, representing the world's first UN-certified carbon-free team (United Nations Department of Economic and Social Affairs, 2022).

At the international level, the International Olympic Committee (IOC) has developed a Sustainability Strategy which focuses on climate action with the goal of moving beyond carbon neutrality and make the games carbon negative by 2030 (International Olympic Committee, 2018). To this aim, a "Strategic intents for 2030" plan was set to reduce both direct and indirect greenhouse gas emissions for operations and events associated with the Olympic Movement's activities, and to adapt sport facilities and events to the consequences of climate change. Indeed, commitment to climate action is now required to cities which candidate themselves to host the Olympic Games (International Olympic Committee, 2017). As a consequence, the Tokyo 2020 summer Olympics strategy for climate action, included the use of pre-existing buildings and renewable energy for games and operations, and the engagement in a carbon offset program (United Nations Department of Economic and Social Affairs, 2022).

In 2016, the United Nations Sport for Climate Action Framework was launched by the United Nations Framework Convention on Climate Change (UNFCCC) and some of the leading sport entities with the aim of providing a systematic framework to the multiple existing initiatives (United Nations Climate Change, 2016). The UNFCCC encourages sport organizations to take systematic measures in order to reduce their carbon emissions and reach climate neutrality by 2050.

Believing in the leadership role that sport can play in driving climate neutrality beyond the sport sector, the Sports for Climate Action (United Nations Climate Change, 2016) brings together sports organizations and their communities in order to pursue two goals:

1. "Achieving a clear trajectory for the global sports community to combat climate change, through commitments and partnerships according to verified standards, including measuring, reducing, and reporting greenhouse gas emissions, in line with the well below 2 degree scenario enshrined in the Paris Agreement";
2. "Using sports as a unifying tool to federate and create solidarity among global citizens for climate action" (United Nations Climate Change, 2016).

With global signatories joining every day, the Sports for Climate Action network has included climate action in the agenda of the sports industry and is tracing the future of sport. This commitment implies for signatories the implementation of actions to reduce greenhouse gas emissions and the transparent communication of their progress. Three years after the establishment of Sports for Climate Action framework,

signatories were requested to halve emissions by 2030 and aim to achieve net-zero by 2040.

The participants to the Sports for Climate Action Initiative support the goals of the Paris Agreement in limiting global temperature rise to 1.5 degrees Celsius above pre-industrial by adhering to five principles:

1. Undertake systematic efforts to promote greater environmental responsibility;
2. Reduce overall climate impact;
3. Educate for climate action;
4. Promote sustainable and responsible consumption;
5. Advocate for climate action through communication.

By adopting these targets, sport sector will really contribute to the sustainable growth of healthy, resilient, and zero carbon communities.

Conclusions

Sport can consistently contribute to tackle climate change and increase sustainability worldwide. In the last few years, many initiatives have been taken in this direction. However, to reach this goal, several stakeholders are called to make further efforts.

First of all, sport must become sustainable by reducing its greenhouse gas emissions and non-renewable energy use, and governments should support these changes by establishing policy frameworks and incentives.

Furthermore, in order to promote sport as a tool to raise people's awareness about climate change, it is fundamental that national governments, in collaboration with international organizations, create collaborations with private actors, academia, science and technology sectors, and citizen communities and organizations. These partnerships are essential to allow sports leading climate actions among other sectors and changes in citizens' lifestyles.

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...Un orologio, metafora del tempo, scandisce l'inizio di una sequenza catartica...
I valori, la conoscenza, la partecipazione e l'ambiente come i meccanismi di un orologio antico sono a vista, correlati e perfettamente sincronizzati tra di loro, e come gli ingranaggi di un meccanismo funzionante essi sono posti a sostegno del futuro dei giovani.
È così che il volto del giovane, ormai uomo, reso forte ed ottimista per la conoscenza acquisita, guarda verso il futuro, verso i suoi obiettivi, qui rappresentati dalla stella e dall'orizzonte: egli è pensoso ma anche sereno, poichè è certo di poterli raggiungere.
L'elemento acqua-mare, sintetizzato con due lievi onde marine, è l'ambiente ideale in cui tutti vorremmo perderci entro una dimensione temporale illimitata che va oltre la realtà.

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