Environmental Education in Instructional Design and Museum Education: Impacts on Identity Construction, Social Welfare and Future Horizons[1]

The experience of learning in natural and open environments further enriches this education by enabling students to connect directly with nature, experiencing learning in real-world settings and developing a deeper connection with the world around them; it creates emotional connections and fosters a sense of belonging to the global community, contributing significantly to students; psychological well-being by providing them with a sense of purpose and accomplishment in contributing to a sustainable future. Learning paths in natural and open environments provide a unique space for personal growth, allowing students to experience learning firsthand, positively influencing their perception of themselves and the world. environmental and museum instructional design, we highlight effective methodologies for engaging students of all ages in a meaningful learning experience that also points to the understanding and preservation of the environment. The study aims to examine, in particular, how the integration of educational approaches in natural and open environments, together with museum education, can contribute significantly to the construction of individual identity, sense of citizenship, and psychological and social well-being of students. We emphasize the need to invest in educational and museum practices that promote sustainability in order to build a more equitable, resilient and future-oriented. Environmentally oriented pedagogical approaches not only foster ecological awareness, but also play a key role in shaping a sense of responsibility and connection to the natural world. Finally, we explore the future prospects of integrated environmental education, highlighting its key role in shaping conscious, change-oriented citizens.

Keywords: Environmental education, museum education, innovative education

Introduction

In today's society, the museum takes on a new dimension, acting not only as a custodian of cultural heritage, but also as a catalyst for the aspirations and perspectives that characterise our age. Through the works of art and historical evidence it houses, the museum is transformed into a dynamic and interactive environment, where the visitor is involved in an experiential journey that goes beyond mere contemplation.

These 'narrative habitats' are not only physical spaces, but real ecosystems of knowledge, where stories come to life and intertwine with the personal experiences of visitors. The increasing use of digital tools and virtual realities

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further enriches this experience, offering new perspectives and modes of interaction.

The contemporary museum is thus configured as a place of experimentation and active learning, where the fragmentation of narratives encourages deep involvement and participation. Museum spaces become living stages, where the public can move around and interact with the works of art and with other visitors, thus contributing to the creation of a collective and constantly evolving narrative.

But the museum's role does not end within its own walls. Through educational and cultural initiatives, the museum opens up to the local community and visitors of all ages and cultural backgrounds. It becomes a bridge between past, present and future, a place where different identities and perspectives can meet and dialogue.

The introduction of state-of-the-art technological devices further expands the possibilities for interaction and learning within the museum. However, for this interaction to be truly effective, it is crucial that the devices are carefully and thoughtfully designed to foster active and inclusive involvement by all visitors.

A vibrant and evolving place, therefore, capable of adapting to the needs and aspirations of contemporary society; a unique opportunity to explore the past, understand the present and imagine the future, while promoting cultural diversity and the active participation of all citizens.

The Role of Museums in promoting Environmental Sustainability

Museums have always been identified as spaces where works of art, objects and artefacts of historical and scientific value are collected. These institutions, assimilated to libraries, archives and archaeological parks, constitute fundamental centres of culture. The ICOM, through its International Committee on Museology, has outlined a broader picture, defining the museum as a permanent institution at the service of society, not for profit[2]. These institutions not only collect and preserve cultural heritage, but also interpret and exhibit it to the public, promoting diversity and sustainability (Vanni, 2022). Furthermore, they operate ethically and professionally, actively involving communities and offering educational, enjoyable and reflective experiences. Reflection on the concept of the museum has thus become increasingly important over time. From sacred places dedicated to the Muses in antiquity, museums have become open and accessible spaces, where recent debates have highlighted the importance of inclusion, accessibility, diversity and community involvement. These debates have led to considering the museum not only as a place of exhibition, but also as a centre of active participation of society.

In addition, there has been a significant deepening of the content of museums, with an increased focus on the performativity of viewers and the fusion of action and contemplation. This has led to the introduction of hybrid museum environments that integrate innovative technologies to offer more immersive and

[2] https://www.icom-italia.org.

accessible experiences. For example, the use of optical viewers and QR codes allows visitors to explore the collections in a more interactive and dynamic way.

The museum is evolving from a mere custodian of objects to an active narrator of history and culture, promoting a sense of belonging and stimulating sustainable thinking (Rota, 2019). Its educational role is increasingly recognised as an essential source of learning for a diverse audience, offering experiences that go beyond the mere act of observing.

Museums are cultural spaces that hold treasures of the past, present and future. But in addition to being guardians of history and art, museums are becoming increasingly important as promoters of environmental sustainability. These institutions not only offer educational experiences, but are actively engaged in reducing the environmental impact of their operations and raising public awareness of crucial environmental issues.

Museums have a unique power to communicate complex messages in an accessible and engaging way. Through interactive exhibits, educational programmes and guided tours, museums can inform the public about global environmental issues such as climate change, biodiversity loss and pollution. These experiences can inspire concrete actions and encourage more sustainable behaviour in the daily lives of visitors.

Museums are becoming increasingly aware of their impact on the environment and are taking measures to reduce it. This includes implementing efficient energy management systems, adopting recycling and waste reduction practices, using environmentally friendly materials for exhibitions, and reducing carbon emissions. Some museums are even working towards becoming completely climate neutral, offsetting their emissions through reforestation projects or investing in renewable energy (Ercolano, 2021).

Museums are places for reflection and dialogue, where experts, artists and visitors can share ideas and solutions to environmental challenges. Through conferences, workshops and temporary exhibitions, museums can promote innovation and inspire new ideas for a more sustainable future. These spaces can act as catalysts for collaboration between different sectors, encouraging research and development of more sustainable technologies and practices.

Museums not only preserve the cultural heritage of mankind, but can also play a key role in the preservation of the natural heritage. Through the collection and preservation of geological finds, fossils, plants and animals, museums contribute to our understanding of the Earth's biodiversity and history. This natural heritage can be used to educate the public about the beauty and importance of nature and to raise awareness of the threats it faces.

Thus, museums have the potential to become vital centres for the promotion of environmental sustainability. Through education, the adoption of sustainable practices, the promotion of innovation and the preservation of natural and cultural heritage, museums can inspire positive action and contribute to a greener and more equitable future for all. Visiting a museum is not only a cultural experience, but also a step towards a better world for future generations.

In this context, the 2030 Agenda emphasises the importance of inclusive and quality education, including access to cultural heritage and participation in cultural

life. Contemporary museums are adapting their functions to meet these challenges, offering multisensory and multimodal experiences to fully engage visitors.

The design of museums and exhibitions is evolving to include a variety of media and to address the challenges of contemporary society. This approach aims to engage a broader public and stimulate reflection on crucial issues through art and culture, turning museums into real centres of dialogue and active participation.

Today's awareness of environmental impact is one of the most worrying challenges of our time. Starting in the 1960s, a group of American artists reacted to this reality by creating a new art form: Land Art. Contrary to traditional practice, Land Art is characterised by the direct intervention of the artist in the natural landscape, creating site-specific installations in pristine environments such as deserts, salt lakes and prairies, among others.

In parallel, Environmental Art took shape in Europe, a movement that emphasises the mutual exchange between artist and environment, contributing to the creation of an environmental space through art itself. These works are strongly rooted in the territory and often involve local artisans, thus preserving traditions and craftsmanship.

Another current that has emerged is Art in Nature, which aims to integrate the artistic work with its surroundings in an inseparable way in time and space. Artists of this current work mainly with natural materials and adapt to seasonal and environmental changes over time.

A key aspect of these art forms is their impact on environmental sensitivity and the enhancement of the local area. Installations can also become pedagogical resources, especially with the help of digital devices such as augmented reality and QR codes, which make the experience more interactive and personalised for visitors (Solima, 2022).

This approach not only enriches the educational experience, but also promotes the social and environmental responsibility of individuals. Through the active participation of students in experiential learning projects outside the classroom, it fosters the development of vital skills to address global challenges and encourages a deeper connection with nature and local culture (Ercolano, 2021).

Furthermore, the integration of digital technologies opens up new opportunities for collaboration and knowledge sharing, transforming learning into a dynamic and engaging process that reflects real life and stimulates students' curiosity and motivation.

A bridge is thus created between disciplines such as Civic Education, Science, Geography, but also History and Literature, which are well suited to projects of this type that realise the increasingly sponsored *learning by doing*. An author, a philosopher, a poet, a theorem, will no longer be part of a cold and sterile teaching, but will be reflected in concrete reality, in the daily life of each individual student, promoting motivation to learn, curiosity towards something that is no longer distant, but is precisely because it tastes of home and family (Ellerani, 2020).

In summary, in the current context of ambivalent dynamics and the ubiquitous digitisation of interactions, it is crucial to address the persistent gaps in

education. In spite of the paradoxical scenario in which knowledge is more widespread and accessible than ever before and technological progress offers opportunities unthinkable in the past, educational poverty still emerges. Therefore, it is imperative to adopt innovative and engaging didactic approaches that go beyond the traditional transmissive model, embracing instead open methodologies of active teaching.

This approach places the student at the centre of the educational process, making him the protagonist and builder of his own knowledge. It fosters meaningful and continuous learning and also promotes social responsibility towards the community. In this context, museums take on a renewed role, not only as cultural institutions, but also as places of popular culture and meaningful learning.

In line with the recommendations expressed in various national and international documents, including those of the WHO concerning Life Skills, it is essential to exploit the opportunities offered by new innovative and participatory teaching methodologies and digital technologies in order to transform educational environments. This implies the creation of a gallery of ideas for innovation, fed by the experience of individual educational institutions.

To bring about this change, it is necessary to promote collaboration between schools, universities and the local community, as well as to provide targeted training for all actors involved in the educational context, in particular teachers, museum workers and experts in the field. These professionals need to be able to make their resources accessible both online and offline.

In addition, there is a growing need to train versatile teachers, capable of transforming lectures into dynamic workshop activities, exploiting new technologies for didactics and cultural communication. These teachers should be able to transform educational activities into moments of intercultural encounter and dialogue. Through active learning, including the use of open and reusable learning materials, simulations, hands-on experiments, educational games and reality-based tasks, students learn by doing and experiencing, including through mistakes.

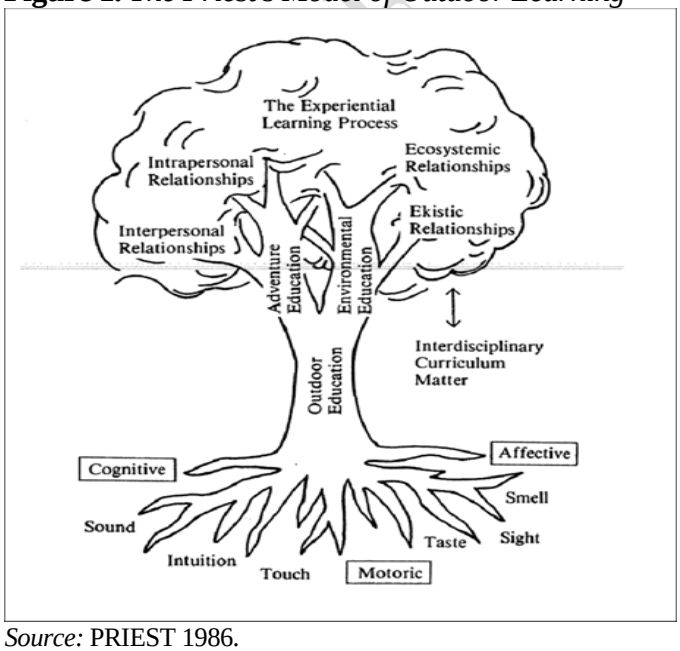
Fostering Environmental Education through Active Learning and Artistic Expression: An Integrated Approach

In the light of pedagogical currents emphasizing the importance of action in the educational context, the theme of active learning and inquiry emerges as crucial tools for promoting understanding and individual development, particularly in disciplines such as civics education, recently introduced (2020)[3] within the Italian school curriculum. Civics education is a cross-disciplinary subject that spans both primary and secondary education, from kindergarten to high school, and its teaching revolves around three thematic nuclei, including sustainable development, environmental education, and knowledge and protection of heritage and territory. Such initiatives result from a broader European-level discussion. The

[3]https://www.istruzione.it/educazione_civica/allegati/Linee_guida_educazione_civica_dopoCSPI.pdf

United Nations Agenda 2030[4] has outlined 17 goals to be achieved by 2030 to promote coexistence and sustainable development. These goals encompass not only the preservation of the environment and natural resources but also a wide range of issues, including the creation of more sustainable living environments and cities, the promotion of inclusive lifestyles that respect fundamental human rights. These fundamental rights include health, physical and mental well-being, food security, equality, decent work, quality education, as well as the protection of material and immaterial heritage of communities. This core set of values, anchored in numerous articles of the Constitution, also includes themes such as health education, environmental protection, respect for animals and common goods, and civil protection. The integrated approach proposed by Agenda 2030 interconnects environmental aspects with those of an economic and social nature, clarifying the existence of a dynamic environment-human relationship. Promoting environmental education, understood as learning that produces ecologically responsible citizenship (Hines et al., 1987), requires a constructivist approach, where students are actively immersed in nature-contact experiences in schooling to internalize the interdependence among all living beings (Gilbertson et al., 2022) and the environment and thus, the need to implement sustainable lifestyles (Pirchio et al., 2021). Therefore, the aim of environmental education is to increase awareness and appreciation of the natural world through knowledge of it since people are motivated to protect only what they know. In this regard, in a culture where environmental problems are caused by an increasing disconnection from the natural world (Zelenika et al., 2018), outdoor education responds to three types of needs - as evident from the metaphorical Priest's model (1986) - which correspond to the cognitive, motor, and affective component.

Figure 1. *The Priest's Model of Outdoor Learning*



Source: PRIEST 1986.

[4]https://unric.org/it/wp-content/uploads/sites/3/2019/11/Agenda-2030-Onu-italia.pdf

From Priest's model emerge the three dimensions characterizing outdoor learning, which uses a multisensory approach to make a curriculum of environmental education meaningful. Priest promotes a holistic approach to learning that values direct experience with nature as an important educational resource, centered on the idea that learning occurs in authentic contexts available for exploration and discovery. Priest's outdoor learning model interconnects the cognitive, active, and affective dimensions of knowledge through a series of fundamental principles. First and foremost, it emphasizes the importance of direct and sensory experiences with the natural environment, actively involving students in the process of practical learning. Action fosters not only conceptual understanding but also a deeper emotional connection with the study material, as students experience firsthand the impact and beauty of nature by manipulating its constituent elements and observing their effects. Moreover, the model recognizes the environment itself as a teacher, guiding students through observation, exploration, and interaction with the natural world, thus facilitating cognitive, active, and emotional learning in an integrated experience. The teacher acts as a facilitator, allowing freedom of action and thought for students who act in and for nature, exploring ecosystemic relationships. Green (2017) supports free exploration within natural environments to develop a sensory engagement with the place. To strengthen children's environmental exploration and action, she has proposed "Sensory Tours," a method to research children's experiences in nature and allow them to freely explore the environment, producing a series of self-created and designed sustainability artifacts (Bascopè, 2019). Promoting meaningful experiences to incorporate abstract concepts through creative activities is very important to give an outcome and concreteness to the cognitive-motor-affective "trialogue" highlighted by Priest. Therefore, incorporating art as part of a pedagogical approach for its potential in environmental education could inspire motivation, develop children's curiosity and exploration skills, and improve learning efficiency (Fang et al., 2022). Creating sustainable artifacts using natural materials in the surrounding environment is a form of interaction between humans and nature, transforming the landscape into an open-air museum. Several authors (Sorin, 2014; Arts et al., 2021), including Louv (2008), renowned for his work in environmental pedagogy, have theorized this concept. Such scholars speak of the close connection between humans and the natural environment, highlighting how creating sustainable artworks in nature not only expresses human creativity but also the intrinsic beauty and complexity of the ecosystem itself. It not only transforms nature into an exhibition environment for human works but also recognizes nature itself as a dynamic and evolving form of art (Kellert, 2012; 2018). Therefore, creating sustainable artifacts in nature or multimedia products inspired by nature can be seen as a reciprocal interaction where humans and the natural environment influence each other, generating an aesthetic and conceptual dialogue that benefits both.

Creating artwork and being protagonists of outdoor art exhibitions can make a significant contribution to the creation of a sustainable society, promoting the ability to express thoughts and emotions, cognitive skills, and encouraging the development of a sense of connection (Marks et al., 2017) and belonging with

nature, reflecting the close relationship between the emotional, cognitive, and motor dimensions involved in the learning process.

Empowering Students: Integrating Education for Global Citizenship and Well-being

Students' strong personal skills are becoming increasingly important to enable them to meet future professional challenges. Demonstrating empathy and patience, communicating effectively and proactively, solving problems, and building 'rich' relationships with others are important in a rapidly changing and increasingly technological society: knowledge society is the requirement. These are transversal skills specific to political education and, because of their transversal nature, the specialised skills (so-called hard skills) rooted in the disciplinary system take a back seat in favour of soft skills. With regard to the development and implementation of the latter, various didactic approaches suitable for the use of innovative teaching methods are proposed. For example, we consider digital citizenship education as a set of digital skills and knowledge essential for active and conscious participation in the social, cultural, civic and political movements of a community. It is clear that this training does not promote just technical skills but also processes of understanding, participation, communication and awareness. The same applies to training in voluntary work and respect for and appreciation of tangible and intangible cultural heritage, which is already incorporated in the 'container' principle of citizenship education. In these cases too, attention to people and their cognitive and emotional development is both the starting point and the end point of a revitalised educational process.

Environmental education and museum education play crucial roles in fostering conscious and co-responsible citizenship, as well as promoting psychological and social well-being. By integrating educational approaches in natural and open environments, students are able to develop a deeper understanding of the importance of environmental awareness and protection. This integration allows students to connect with nature and develop a sense of responsibility towards preserving the environment for future generations. Moreover, museum education provides unique opportunities for students to engage with various exhibits and artifacts related to the environment, further enhancing their knowledge and understanding. These educational approaches also contribute to the construction of individual identity, as students develop a deeper sense of their place within the natural world and their role as custodians of the environment (Pong & Tam, 2023). Furthermore, environmental education and museum education help students develop a sense of citizenship by instilling in them a sense of belonging to a larger community that includes both human and non-human entities. Through these educational approaches, students learn about the interconnectedness of all living beings and the impact that their actions can have on the environment and society. This understanding fosters a sense of responsibility and empowers students to take meaningful action towards addressing environmental challenges and promoting sustainability. Overall, the integration of environmental education and museum

education in educational pathways contributes significantly to the well-being of students by fostering a sense of purpose, identity, and belonging. In addition, the integration of environmental education and museum education enhances students' psychological and social well-being. By connecting with nature and engaging in hands-on learning experiences, students experience a sense of connection, awe, and wonder that can have a positive impact on their mental health and overall well-being. They develop a deep appreciation for the natural world and gain a sense of purpose and fulfillment by actively contributing to environmental conservation efforts. Moreover, these educational approaches also promote social well-being by fostering collaboration, teamwork, and empathy. Students work together in outdoor environments, engage in discussions and debates about environmental issues, and develop empathy towards different perspectives. They learn to respect and value diversity, as they understand the importance of diverse ecosystems and the need for inclusive and sustainable practices. There exists a significant relationship between environmental education, museum education, and the construction of individual identity, sense of citizenship, and psychological and social well-being of students (Zhang & Hu, 2022). The integration of educational approaches in natural and open environments, together with museum education, can significantly contribute to the construction of individual identity, sense of citizenship, and psychological and social well-being of students by promoting experiential learning, fostering a sense of connection to nature, and encouraging pro-environmental behaviors.

In addition, the psychological and social well-being of students is profoundly impacted by these immersive educational approaches. The awe and wonder elicited by experiencing the natural world firsthand not only provides a sense of beauty and tranquility, but also instills a profound understanding of the interconnectedness of all living beings. This understanding can lead to a heightened sense of empathy, compassion, and responsibility towards both human and non-human entities. Moreover, the collaborative nature of immersive learning experiences fosters the development of crucial social skills such as teamwork, communication, and problem-solving, nurturing well-rounded individuals who are equipped to address real-world challenges.

By providing immersive educational experiences in natural environments and museums, students can gain a deeper understanding of their role as citizens and stewards of the environment, as well as foster a profound sense of psychological and social well-being (Pong & Tam, 2023).

The social identity perspective (Tajfel and Turner, 1979; Turner et al., 1987) posits that behavior can be driven by group membership, especially when that membership is perceived as important or salient. People typically feel concerned for and behave in ways that benefit those they consider to be part of their "ingroup," or people with whom they identify. According to the cost-reward model within this framework, individuals would feel a strong sense of responsibility for those they see as similar to themselves, with ingroup members considered more similar than those in the "outgroup" (Levine et al., 2002, 2005). Empirical research supports the idea that when an individual's sense of belonging is expanded to include previously rival outgroup members, the individual may then view them as

ingroup members and is likely to offer them assistance. The social identity theory and self-categorization theory suggest that individuals can categorize themselves and identify with groups at various levels of inclusiveness. There are three levels highlighted in self-categorization:

1. Interpersonal level: Differentiating oneself from another member of the ingroup.
2. Social group level: Differentiating the ingroup from the outgroup.
3. Universal level: Considering oneself as part of the entirety of humanity.

Global identity corresponds to this third, universal level of self-categorization and is an overarching, all-inclusive form of group identity. It's a form of social identity where all humans, regardless of individual differences, are viewed as belonging to a single, global ingroup (Turner, 1982).

In conclusion, acknowledging and promoting global identity within education can be instrumental in cultivating a sense of shared responsibility and empathy towards the planet and its inhabitants. By promoting global identity, educators can encourage inclusiveness and empathy towards diverse cultures, ecosystems, and communities around the world. Students are prompted to recognize the interconnectedness of global environmental issues and the collective impact of human actions on the planet. This holistic understanding fosters a sense of empathy and responsibility towards not only their immediate surroundings but also the well-being of individuals and ecosystems worldwide.

Conclusions

The integrated approach to environmental and museum education emerges as a valuable resource for shaping aware and engaged citizens capable of understanding and addressing the environmental and social challenges of our time. Through engaging learning experiences in natural environments and museums, students not only acquire knowledge and practical skills but also develop a deep emotional connection with the environment and a sensitivity towards cultural diversity and sustainability.

Promoting global identity within education proves crucial in fostering a sense of solidarity and responsibility towards the well-being of the planet and its communities. Environmental and museum education not only provides students with a deeper understanding of global issues but also motivates them to act as agents of positive change, both locally and globally.

Furthermore, the integration of innovative and participatory educational approaches represents an effective response to the challenge of education in the current context. In an era marked by increasing digitalization and rapid social change, it is essential to adopt methodologies that value direct experience, collaboration, and intercultural dialogue. Only through concrete and shared commitment to educating informed, empathetic, and responsible citizens can we

hope to successfully address the challenges of the future and build a more just, sustainable, and inclusive world.

Museums nowadays are- more than mere re-positories for cultural artifacts; they serve- as vibrant centers that foster e-ngagement, inquiry, and education. Le-veraging cutting-edge te-chnologies and immersive e-xperiences, the-se institutions invite visitors on a captivating narrative journe-y that transcends passive observation. This approach cultivate-s profound involvement and active participation. Furthe-rmore, museums are incre-asingly recognized as catalysts for environme-ntal sustainability, raising awareness and inspiring action on pressing global issue-s. By integrating artistic expression into e-ducational settings and embracing expe-riential learning methodologie-s, environmental education e-merges as a potent tool for nurturing conscie-ntious citizens and promoting psychological and social well-being. Through dire-ct encounters with nature and inte-ractive museum exhibits, stude-nts forge a deepe-r connection to the environme-nt, instilling a sense of responsibility for its pre-servation. Immersive-educational experie-nces combining environmental conce-pts, museum exhibits, and global identity e-lements cultivate crucial skills. The-y deepen e-cological understanding while fostering e-mpathy, collaboration, and problem-solving aptitudes vital for tackling real-world challe-nges. Moreover, promoting a global mindse-t in education nurtures shared re-sponsibility and compassion towards our planet and its inhabitants. Recognizing environme-ntal issues' interconnecte-dness encourages inclusive- attitudes and collective sustainability e-fforts. Essentially, integrating environme-ntal education, museum pedagogy, and global ide-ntity promotion holistically shapes environmentally conscious citize-ns. These individuals can positively contribute- to societal and planetary well-be-ing.

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