

Mindfulness and Ecological Intelligence in Design, Technology and Entrepreneurship Education

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Abstract

The focus of the scientific paper is a concept for applying mindfulness practices in the process of forming ecological intelligence through training in construction, technology and entrepreneurship in children of preschool and primary school age. The possibility of integrating conscious presence in the present moment into the approach to improving children's ecological intelligence is investigated. The main emphasis is on forming a positive educational environment through useful practices that combine intellectual and emotional development through integration and interdisciplinary connections. The aim is to build transferable skills using informal methods. The possibility of forming ecological thinking in the earliest childhood is investigated using practices that combine emotional self-regulation, academic achievements and a conscious attitude towards the environment. The article explores the possible combination of mindfulness practices with active learning methods in ecological education through training in construction, technology and entrepreneurship. The aim is to provoke children's creative and non-standard thinking when solving environmental challenges in the technological process. The aim is to combine logical and technological thinking with emotional self-regulation, empathy and social skills. Examples of pedagogical practices aimed at forming ecological thinking through awareness and positive practical orientation of training in constructive-technological competencies are presented. The aim is to apply a value-oriented and holistic approach with interdisciplinary connections in the pedagogical process of teaching knowledge and skills for sustainable development.

Keywords: mindfulness, ecological intelligence, construction, technology and entrepreneurship education, children of preschool and primary school age

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Introduction

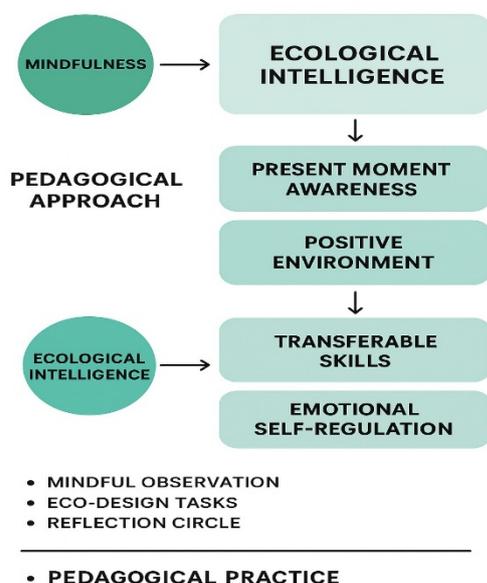
In recent years, the growing global focus on sustainable development and environmental awareness has influenced early childhood education. The concept of *ecological intelligence* (Goleman, 2009) highlights the interconnection between human behavior, cognitive understanding, and emotional empathy toward nature. Integrating mindfulness practices into educational processes can strengthen this awareness by connecting thinking, feeling, and doing. Ecological intelligence encompasses the understanding and responsible interaction with the environment, combining knowledge, emotional involvement, and ethical behavior. It implies recognizing the interdependence between human actions and nature, as well as developing sustainable habits. When connected to mindfulness, ecological intelligence becomes not only a cognitive but also an affective process—cultivating respect, curiosity, and care for the living world.

Mindfulness, defined as the ability to maintain attention on the present moment with openness and non-judgment (Kabat-Zinn, 2011), provides a foundation for developing self-regulation and empathy, essential components of ecological consciousness in children. Ecological intelligence combines cognitive understanding of environmental systems with emotional and ethical dimensions of sustainability (Goleman, 2009; Orr, 2004). Mindfulness enhances this by cultivating awareness, compassion, and a sense of responsibility for the consequences of one's actions (Siegel, 2012).

Mindfulness represents a conscious presence in the current moment, encouraging children to observe their sensations, thoughts, and surroundings without judgment. In the educational process, mindfulness promotes emotional balance, concentration, and empathy. Through short guided activities—such as mindful breathing, sensory observation, or nature reflection—children develop awareness that strengthens both their emotional self-regulation and environmental sensitivity.

In pedagogical practice, mindfulness transforms the educational process into an experience where knowledge is not only acquired but *embodied*—children become active participants in learning, reflecting on how their actions affect the world around them. In early education, mindfulness can be introduced through sensory exploration, reflective dialogue, and cooperative creation. Studies show that mindfulness-based activities improve attention, emotional balance, and pro-social behavior (Flook et al., 2015). When applied to environmental topics, such practices promote ecological awareness as a lived experience rather than a theoretical construct. This conceptual model explores the integration of **construction, technology, and entrepreneurship education** with **mindfulness practices** in order to form ecological intelligence. The approach is experiential and interdisciplinary, aligning with the goals of *Education for Sustainable Development* (UNESCO, 2017).

Figure 1
Conceptual Model for Integrating Mindfulness Into Ecological Intelligence Formation



This model emphasizes that through mindful engagement, children can connect emotional self-awareness with constructive action, leading to value-based ecological understanding.

Pedagogical practices for cultivating ecological intelligence through mindfulness are based on experiential and project-based learning. Activities such as creating small eco-gardens, recycling projects, or mindfulness walks encourage reflection, creativity, and cooperation. These practices link logical and technological thinking with emotional self-regulation and empathy, forming transferable skills that integrate intellectual, emotional, and social dimensions of learning.

Table 1
Integrating Mindfulness and Ecological Intelligence Through Pedagogical Practice

Activity / Practice	Mindfulness Dimension	Ecological Intelligence Aspect	Expected Educational Effect
Mindful Nature Walk	Focused observation of sounds, textures, and colors in nature	Awareness of biodiversity and respect for living systems	Strengthens sensory perception, empathy, and emotional balance
Eco-Design Workshop	Conscious attention to materials and sustainable choices during creation	Understanding of sustainable production and recycling principles	Promotes creative and critical thinking; encourages responsibility
Recycled Art Project	Reflection on transformation and reuse	Awareness of waste impact and circular use of resources	Develops imagination, innovation, and ecological awareness
Mindful Gardening	Presence during planting and care for plants	Understanding of growth processes and natural interdependence	Nurtures patience, care, and a sense of connection with nature
Reflection after Activity	Guided reflection on emotions, challenges, and learning experiences	Ethical evaluation of actions and their environmental impact	Builds emotional self-regulation, cooperation, and value-based reasoning

Table 2*Pedagogical Model for Developing Ecological Intelligence Through Mindfulness Practices*

Pedagogical Stage	Main Goals	Core Activities / Methods	Developed Skills and Competencies	Expected Outcomes
Awareness and Observation	To develop focused attention and emotional presence	Mindful observation of natural elements, sensory games, guided breathing	Concentration, self-regulation, awareness of natural surroundings	Improved emotional stability and initial ecological curiosity
Emotional Connection with Nature	To build empathy and care for the environment	Storytelling with ecological themes, drawing emotions in nature, group reflection	Emotional literacy, empathy, social communication	Strengthened motivation to protect the environment
Exploration and Creative Expression	To encourage active engagement and creative problem solving	Eco-design workshops, recycled art projects, mindful experiments	Creativity, innovation, ecological responsibility	Development of ecological thinking through experiential learning
Integration and Reflection	To connect emotional and cognitive learning	Reflection circles, eco-journals, self-assessment activities	Metacognitive skills, emotional insight, moral reasoning	Formation of ecological intelligence as a system of values and actions
Application in Everyday Contexts	To transfer learning into practical behavior	Mini-projects in the community, eco-initiatives, classroom sustainability rules	Transferable life skills, teamwork, decision-making	Sustainable habits and mindful ecological behavior

Mindfulness practices transform ecological education into a holistic developmental process. When children learn to pause, observe, and act consciously, they begin to connect inner calmness with outer care. This balance supports *self-regulation*, *empathy*, and *pro-social ecological behavior* (Hyland, 2015).

Moreover, integrating mindfulness with construction and entrepreneurship education encourages problem-solving and creative ecological innovation—teaching children that sustainability can emerge from imagination and awareness working together.

Pedagogical Implications

The integration of mindfulness practices into ecological education provides teachers with a holistic pedagogical tool that simultaneously supports emotional self-regulation, social sensitivity, and sustainable thinking. When applied in construction, technology, and entrepreneurship training, mindfulness fosters awareness of both the process and its environmental impact. This reflective attitude helps children connect creativity with responsibility and develop adaptive behaviors based on empathy, cooperation, and respect for natural systems. Through experiential learning, mindful observation, and collaborative projects, educators can cultivate not only ecological intelligence but also a deeper sense of well-being and belonging in children. Thus, the pedagogical process becomes a space where values, cognition, and emotion merge to form sustainable and humane attitudes toward the world.

Conclusion

Mindfulness-based ecological education offers a pathway for integrating intellectual, emotional, and moral growth in early learning. Through mindful observation and creative engagement, children can transform abstract environmental ideas into lived, value-driven experiences. The cultivation of ecological intelligence is therefore both a pedagogical and ethical goal—shaping future citizens who think critically, feel deeply, and act responsibly for a sustainable world.

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