

Integration of Nature Education into the Formal Curriculum in Elementary Schools: Impact on Students' Emotional Intelligence and Environmental Intelligence

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ABSTRAK

Integrasi pendidikan alam ke dalam kurikulum formal sekolah dasar merupakan pendekatan strategis untuk menjawab kebutuhan akan pendidikan holistik yang tidak hanya berorientasi pada capaian kognitif, tetapi juga pada pengembangan aspek emosional peserta didik serta kesadaran lingkungan. Penelitian ini bertujuan untuk menganalisis implementasi pendidikan alam dalam kurikulum formal dan dampaknya terhadap kecerdasan emosional serta kecerdasan lingkungan siswa sekolah dasar. Pendekatan penelitian yang digunakan adalah kualitatif dengan desain studi kasus, yang melibatkan kepala sekolah, guru, dan siswa sebagai subjek penelitian. Teknik pengumpulan data dilakukan melalui observasi partisipatif, wawancara mendalam, dan studi dokumentasi, sedangkan analisis data dilakukan secara interaktif melalui tahap reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa integrasi pendidikan alam mampu menciptakan pembelajaran kontekstual yang bermakna dan berbasis pengalaman. Implementasi pembelajaran berbasis alam mendorong keterlibatan aktif siswa, memperkuat regulasi emosi, empati, serta keterampilan sosial. Selain itu, pengalaman langsung dengan lingkungan membentuk kesadaran ekologis, sikap bertanggung jawab, dan perilaku berkelanjutan terhadap lingkungan. Dukungan kurikulum, peran guru, dan kebijakan sekolah menjadi faktor kunci keberhasilan integrasi pendidikan alam. Penelitian ini menegaskan bahwa pendidikan alam berkontribusi secara signifikan dalam membentuk peserta didik yang cerdas secara akademik, matang secara emosional, dan memiliki kecerdasan lingkungan yang kuat.

Kata kunci: Kecerdasan emosional; Kecerdasan lingkungan; Pendidikan alam.

ABSTRACT

The integration of nature education into the formal elementary school curriculum is a strategic approach to addressing the need for holistic education that is not only oriented towards cognitive achievement, but also the development of students' emotional aspects and environmental awareness. This study aims to analyze the implementation of nature education in the formal curriculum and its impact on elementary school students' emotional and environmental intelligence. The research approach used was a qualitative case study design, involving principals, teachers, and students as research subjects. Data collection techniques were carried out through participatory observation, in-depth interviews, and documentation studies, while data analysis was carried out interactively through reduction, presentation, and drawing conclusions. The results showed that the integration of nature education was able to create meaningful, experiential contextual learning. The implementation of nature-based learning encouraged active student involvement, strengthened emotional regulation, empathy, and social skills. In addition, direct experience with the environment formed ecological awareness, responsible attitudes, and sustainable environmental behavior. Curriculum support, teacher roles, and school policies were key factors in the success of nature education integration. This study confirmed that



nature education contributed significantly to developing students who were academically intelligent, emotionally mature, and possessed strong environmental intelligence.

Keywords: *Emotional intelligence; Environmental intelligence; Nature education.*

INTRODUCTION

Learning patterns in elementary schools currently still display a dominant academic orientation that emphasizes cognitive achievement and mastery of formal material. This focus creates a learning structure that provides little space for the balanced development of students' affective and socio-emotional aspects. Learning activities that lack direct experience with the real world result in students being more familiar with abstract concepts than the realities of their surroundings. Students' interactions with nature are often limited to theoretical discourse without meaningful empirical experience. This situation has the potential to weaken students' ability to recognize their own emotions, manage them, and develop social and ecological empathy. The relationship between humans and the environment develops cognitively but not emotionally. The educational process then loses the dimension of character formation rooted in real-life experiences (Saputra et al., 2024). This narrow learning orientation creates a gap between holistic educational goals and formal curriculum practices in elementary schools.

Nature education presents itself as a learning approach that places direct experience at the center of students' learning processes. Interaction with the environment allows students to build understanding through observation, exploration, reflection, and emotional engagement. Experiential learning processes foster a more personal connection between students and their surroundings. These experiences foster meaningful learning because knowledge is built through direct engagement, not simply the transmission of information. Learning activities in nature foster social dynamics that encourage cooperation, empathy, communication, and caring among students. Social relationships formed through nature activities naturally enrich students' emotional development. Self-awareness grows as sensitivity to the physical and social environment increases. Learning then develops as a character-building process integrated with life experiences (Arsyah, 2025).

Emotional intelligence is a crucial foundation for the personality development and psychological well-being of elementary school students. The ability to recognize emotions, manage them, and understand the emotions of others forms the basis for healthy social relationships. Strong emotional development helps students cope adaptively with learning pressures and social challenges. Environmental intelligence complements this dimension by fostering ecological awareness and concern for environmental sustainability. An emotional connection to the environment fosters a sense of responsibility toward nature as a shared living space. The value of ecological awareness develops not only as knowledge but also as moral awareness. The integration of emotional intelligence and environmental intelligence shapes students' holistic character. Education no longer functions merely as the transmission of knowledge, but as a process of developing whole individuals.

Elementary school is a strategic phase in the formation of long-term values, attitudes, and behavioral patterns. Personality structures begin to form through repeated and meaningful learning experiences. The learning environment has a significant influence on shaping students' ways of thinking and feeling. Experiential learning forms lasting emotional memories. Interaction with nature creates powerful affective experiences in the learning process. These experiences foster an emotional attachment to the environment. Emotional relationships formed early in life foster long-term

ecological awareness. Education then serves as a foundation for sustainable character, not merely a temporary academic phase.

The formal elementary school curriculum plays a strategic role in shaping the direction of student development. The curriculum structure systematically determines the types of learning experiences students receive. Integrating nature education into the curriculum allows environmental experiences to become a core part of learning. Nature-based learning is no longer an additional activity separate from the formal education system. The learning process becomes more contextual because it is directly connected to students' real lives. Emotional and ecological values are embedded through a sustainable learning structure (Chafshah et al., 2024). The education system is shifting from a normative approach to a transformative one. Schools serve as spaces for integrated ecological and emotional character formation.

The integration of nature education creates a paradigm shift in learning from a material-centered to an experience-centered one. The learning process becomes more reflective because students are directly involved in environmental realities. Knowledge develops through the relationship between cognition, emotion, and experience. Learning shapes ecological awareness as part of students' self-identity. The relationship between humans and nature is understood as interdependent. Education shapes students' perspectives on the sustainability of life. Schools act as agents of transformation in ecological values. Learning not only produces intelligent individuals, but also caring and responsible individuals (Rina & Anggela, 2022).

Educational transformation requires adaptive and visionary curriculum design. Learning structures need to open up space for interdisciplinary and experiential approaches. Nature education provides an integrative framework between science, social, moral, and emotional aspects. The learning process becomes more vibrant because it is rooted in the realities of students' lives. Student engagement increases as learning becomes more relevant to everyday experiences. The relationship between school and the environment becomes more harmonious. Education develops as a system rooted in real life. The curriculum serves as an instrument for shaping a generation with ecological character.

The integration of nature education into the formal elementary school curriculum is a strategy for sustainable human resource development. Education no longer merely fosters intellectual intelligence but simultaneously fosters emotional and ecological awareness. The learning process produces students who are adaptive, empathetic, and environmentally conscious. The relationship between individuals and nature is formed as part of their identity. Schools serve as centers for the formation of socio-ecological character. Education becomes a means of developing a generation responsible for living together. Sustainable values are embedded through a structured education system. The curriculum serves as the foundation for the formation of a civilization oriented toward the balance between humans and nature.

METHODOLOGY

This research uses a qualitative approach with a case study design to deeply understand the integration of nature education into the formal curriculum in elementary schools and its impact on students' emotional and environmental intelligence. A qualitative approach was chosen because the research focuses on the processes, meanings, and subjective experiences experienced by students and teachers during nature-based learning. Case studies allow researchers to comprehensively explore phenomena within the real-life context of elementary school education.

The research subjects included principals, classroom teachers, and elementary school students who had implemented nature education integration in their learning activities. Subjects were selected purposively, considering their direct involvement in the planning and implementation of nature-based learning. Teachers were selected based on their teaching experience and active involvement in nature education integration, while students were selected from classes that consistently participated in these learning activities. Principals were involved to gain policy perspectives and institutional support for curriculum implementation.

Data collection techniques included participant observation, in-depth interviews, and documentation studies. Participant observation was used to directly observe the nature-based learning process, student interactions, and emotional and behavioral responses to the environment that emerged during the activities. In-depth interviews were conducted to explore teachers' and students' perceptions, experiences, and reflections regarding the influence of nature education on emotional development and environmental awareness. The documentation study included an analysis of the curriculum, learning tools, lesson plans, and teacher reflection notes supporting the integration of nature education.

Research instruments serve as aids in systematic data collection. The researcher serves as the primary instrument, conducting direct observations, interviews, and data interpretation. Observation guidelines are used to record indicators of emotional and environmental intelligence that emerge during learning activities. Interview guidelines are semi-structured to allow for in-depth exploration of the research subjects' experiences.

Data analysis was conducted interactively and continuously through the stages of data reduction, data presentation, and conclusion drawing. The obtained data were selected and coded based on themes relevant to the integration of nature education, emotional intelligence, and environmental intelligence. Data presentation was conducted in the form of a descriptive narrative that illustrated the patterns, relationships, and meaning of the research findings. Conclusions were drawn in stages, taking into account the consistency and depth of the data obtained.

Data validity was maintained through source triangulation, technical triangulation, and time triangulation. Comparisons of observational, interview, and documentation data were conducted to ensure consistency of findings. Data validation was also strengthened through member checking, involving informants to confirm the researcher's interpretations. This process aims to increase the credibility and trustworthiness of the research results.

Research ethics were maintained by securing approval from the school and research subjects before data collection. Subject confidentiality was ensured by using codes or initials when reporting research results. The research was conducted with respect for the rights, comfort, and safety of all participants. These ethical principles serve as the primary foundation for all stages of qualitative research.

DISCUSSIONS AND RESULT

Implementation of Nature Education Integration in the Formal Elementary School Curriculum

The integration of nature education into the formal elementary school curriculum begins with a learning planning process that positions the environment as the primary learning resource. Teachers develop learning materials by linking core subject competencies to the potential of the school's environment. The curriculum structure is

adjusted so that nature-based learning experiences are not separated from formal learning objectives. Learning planning reflects efforts to align academic demands with student character development (Arsyad et al., 2024). This process demands teachers' creativity in packaging learning materials to ensure they are relevant to real-world situations. The link between theory and practice forms the foundation of learning design. Nature education is positioned as a pedagogical approach, not simply a variety of methods. The curriculum then develops as a contextual and adaptive learning system.

The implementation of nature-based learning demonstrates significant changes in classroom dynamics. Learning activities shift from closed classrooms to open spaces that allow for direct exploration. Students actively engage through observation, discussion, and reflection on the natural phenomena they encounter. The learning process is participatory and collaborative. Interactions between students and the environment create authentic learning experiences. The teacher acts as a facilitator, guiding the exploration and reflection process. Learning becomes more flexible and responsive to field situations. The formal learning structure is maintained through systematic activity management.

Integrating nature education requires teachers to be prepared to manage cross-subject learning. Science, social studies, language, and character education are interwoven into a single, integrated learning experience. Teachers adapt evaluation strategies to capture student development holistically. Assessments focus not only on academic outcomes but also on student processes and attitudes. Assessment instruments are developed to observe student participation, collaboration, and reflection. An authentic approach forms the basis of the learning evaluation process. Nature-based learning broadens the meaning of assessment in elementary education. The curriculum serves as a dynamic framework that supports meaningful learning (Collado et al., 2025).

School institutional support is a crucial factor in the sustainability of nature education integration. School policies legitimize the use of the environment as a learning space. The availability of supporting facilities strengthens the implementation of nature-based learning. The principal plays a role in creating a conducive academic climate. Collaboration between teachers encourages the exchange of best practices in learning. Schools develop as learning communities open to pedagogical innovation. The integration of nature education becomes part of the school culture. Learning is no longer limited by the physical classroom space.

The implementation of nature education in the formal curriculum demonstrates a paradigm shift in basic education. The learning process is oriented toward experience and the formation of meaning. Students are positioned as active subjects in the learning process. The curriculum serves as a tool for character building and ecological awareness (Utari, 2025). Education develops as a process integrated with students' real lives. This integration creates continuity between educational goals and learning practices. Schools act as holistic learning spaces. Nature education serves as the foundation for sustainable curriculum transformation.

The Impact of Nature Education Integration on the Development of Students' Emotional Intelligence

The development of students' emotional intelligence through nature education is evident in changes in how they recognize and express emotions. Learning experiences in nature present situations that demand self-awareness and emotional control. Students learn to face challenges, uncertainty, and group dynamics directly. These interactions develop natural emotional regulation skills. The learning process involves not only cognitive aspects but also affective ones. Emotional experiences become an integral part

of learning. Students' self-awareness develops through active engagement in nature activities. Learning fosters a balance between thoughts and feelings.

Nature-based learning activities foster empathy and social sensitivity. Students interact in groups, requiring cooperation and mutual understanding. Learning situations outside the classroom foster the need for effective communication. Minor conflicts that arise become avenues for emotional learning. Teachers facilitate reflection on students' social experiences. This process of reflection helps students understand their own feelings and those of others. Empathy develops through real-life experiences, not just verbal instruction. Learning develops lasting social skills.

Emotional intelligence also develops through student involvement in decision-making during learning. Nature exploration activities provide students with the opportunity to choose, plan, and take responsibility. This process fosters self-confidence and emotional independence. Students learn to understand the consequences of each action. This experience fosters more mature self-control. Learning provides space for constructive emotional expression. Emotional awareness develops as a result of reflective experiences. Education plays a role in fostering emotional maturity.

The natural environment provides rich and diverse emotional stimuli. The beauty, challenges, and serenity of nature influence students' emotional states. The resulting emotional responses become the basis for learning reflection. Teachers guide students in recognizing and managing these responses. This process strengthens the connection between emotions and learning. Affective experiences form the foundation for developing positive attitudes toward learning. Emotional intelligence develops through connectedness with the environment. Education becomes a process that deeply touches students' emotional dimensions.

Strengthening emotional intelligence through nature education contributes to a positive learning climate. Students demonstrate increased self-confidence and collaborative skills. Social relationships in the classroom become more harmonious. Learning takes place in a supportive and inclusive atmosphere. Teachers act as emotional guides for students. Schools develop as safe spaces for emotional expression. Education creates a balance between achievement and emotional well-being. Emotional intelligence is the foundation for long-term learning success.

The Impact of Nature Education Integration on Students' Environmental Intelligence and Caring Attitudes

The integration of nature education plays a significant role in developing elementary school students' environmental intelligence. Direct experiences with nature foster concrete ecological understanding. Students learn more than just theoretical environmental concepts. Real-world interactions foster awareness of the interconnectedness of humans and nature. Experiential learning reinforces the meaning of sustainability. Environmental values develop through active engagement. Nature education fosters reflective ecological awareness. Learning becomes a means of internalizing environmental values.

Environmentally conscious behavior emerges as a manifestation of students' environmental intelligence. Activities such as maintaining cleanliness and caring for the environment become part of the learning routine. Students demonstrate responsibility for the natural learning space. Ecological awareness is reflected in daily actions. Teachers guide reflection on the impact of human behavior on nature. The reflection process strengthens ecological moral understanding. Learning fosters an emotional connection to the environment. Caring attitudes develop as part of students' identities.

Environmental intelligence develops through a systemic understanding of nature. Students learn to recognize the interconnectedness of environmental elements. Observational activities broaden ecological perspectives. Learning encourages cause-and-effect thinking within an environmental context. Ecological awareness develops gradually and sustainably. Nature education strengthens environmental literacy from an early age. Learning fosters critical ecological thinking. Schools serve as centers for sustainability learning.

Sustainability values are instilled through consistent learning experiences. Nature education shapes long-term attitudes toward the environment. Students develop a sense of ownership of their natural surroundings. Emotional connections strengthen commitment to environmental protection. Learning creates an internal ecological awareness. Environmental values are not imposed but develop through experience. Education shapes authentic ecological character. The curriculum serves as a tool for internalizing sustainability values.

Developing environmental awareness through nature education expands the role of schools in sustainable development. Schools become agents for shaping the ecological awareness of the younger generation. Education contributes to long-term solutions to environmental problems. Students are prepared to become ecologically responsible individuals. Learning shapes a collective awareness of sustainability. The curriculum serves as an instrument of social transformation. Nature education strengthens the relationship between humans and nature. Schools become learning spaces for a sustainable future.

CONCLUSION

Based on the discussion above, the integration of nature education into the formal elementary school curriculum has proven to be a strategic approach in enriching the holistic learning process. Nature education provides contextual learning experiences that can bridge academic demands with student character development. The curriculum, integrated with the environment, enables students to build knowledge through direct experience and meaningful reflection. The nature-based learning process strengthens students' role as active subjects in building understanding and values. These experiences significantly contribute to the development of emotional intelligence through increased self-awareness, emotional management, empathy, and social skills. Interaction with nature and the dynamics of learning groups create a space for deep and sustainable affective learning. The integration of nature education also plays a crucial role in shaping students' environmental intelligence through the internalization of values of ecological care and responsibility. Environmental awareness develops not only as knowledge but also as concrete attitudes and behaviors in students' daily lives. Support from the school curriculum and policies is a determining factor in the success of systematically implementing nature education. The role of teachers as facilitators of contextual learning strengthens the effectiveness of nature education integration. Schools serve as spaces for the integrated formation of emotional and ecological awareness. The integration of nature education into the formal curriculum provides an important foundation for the formation of a generation that is academically intelligent, emotionally mature, and responsible for environmental sustainability.

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