



Analysis of School Environment Development Activities on the Formation of Children's Naturalistic Intelligence at Pertiwi Panggung Kindergarten

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Abstrak

Penelitian ini bertujuan untuk menganalisis kegiatan pembinaan lingkungan sehat di TK Pertiwi Panggung terhadap pembentukan kecerdasan naturalis anak. Pendidikan lingkungan hidup menjadi penting pada usia dini, mengingat peranannya dalam menumbuhkan kesadaran ekologis dan sikap peduli lingkungan. Kegiatan yang diterapkan meliputi berkebun, memilah sampah, dan menjaga kebersihan, yang secara langsung memberikan pengalaman belajar berbasis alam kepada anak-anak. Metode penelitian yang digunakan adalah kualitatif deskriptif, dengan pengumpulan data melalui observasi, wawancara, dan dokumentasi. Hasil penelitian menunjukkan bahwa pembinaan lingkungan sehat tidak hanya meningkatkan kecerdasan naturalis anak, tetapi juga menanamkan sikap disiplin, tanggung jawab, dan cinta alam. Beberapa tantangan yang dihadapi antara lain keterbatasan lahan dan dukungan orang tua. Selain itu, keterlibatan aktif guru dalam memfasilitasi kegiatan ini sangat berpengaruh terhadap keberhasilan program. Kesimpulannya, program pembinaan lingkungan sehat di sekolah berperan signifikan dalam membentuk kecerdasan naturalis dan karakter peduli lingkungan pada anak usia dini. Hal ini menunjukkan pentingnya integrasi pendidikan lingkungan dalam kurikulum pendidikan anak usia dini untuk mendukung perkembangan karakter dan kecerdasan anak secara holistik.

Kata kunci: kecerdasan naturalis, lingkungan sekolah

Abstract

This study aimed to analyze the impact of healthy environment development activities at TK Pertiwi Panggung on the formation of children's naturalistic intelligence. Environmental education is crucial in early childhood as it plays a role in fostering ecological awareness and an attitude of caring for the environment. The activities

implemented included gardening, waste sorting, and maintaining cleanliness, which directly provided nature-based learning experiences for the children. The research method used was descriptive qualitative, with data collection through observation, interviews, and documentation. The results indicated that the healthy environment development activities not only enhanced children's naturalistic intelligence but also instilled discipline, responsibility, and a love for nature. Some challenges faced included limited space and parental support. Additionally, the active involvement of teachers in facilitating these activities had a significant impact on the success of the program. In conclusion, the healthy environment development program at school plays a significant role in shaping children's naturalistic intelligence and fostering environmental care characteristics in early childhood. This highlights the importance of integrating environmental education into early childhood education curricula to support the holistic development of character and intelligence.

Keywords: naturalistic intelligence; school environment

Introduction

Schools are educational institutions that provide facilities and an environment for the learning process. In schools, children acquire knowledge, skills, and values that support academic, social, and emotional development by observing what is in their surroundings. The school environment consists of all elements around the school that influence the teaching and learning process as well as the child's development. The school environment includes two main aspects: physical environment and social environment. The physical environment, according to Rinja Efendi, (2022), refers to all the facilities and infrastructure available at the school, such as classroom buildings, teacher's rooms, libraries, laboratories, sports fields, and gardens. A well-maintained and comfortable physical environment can support children's learning activities and create a conducive atmosphere for their development. The social environment refers to the relationships established between children, teachers, staff, and parents. In this social environment, children learn to socialize, interact, and cooperate with their peers. Good relationships between children and teachers can create a positive school climate, enhance learning motivation, and support character development.

The importance of fostering a healthy school environment in Indonesia is closely related to the need to create spaces that support the holistic development of children Vina Shafa Ningrum (2023) In the present era, global challenges regarding environmental issues

are becoming more urgent, which impacts the way we view early childhood education. Schools, as the main places for children's learning, play a crucial role in shaping children's character and intelligence, including naturalistic intelligence, which involves understanding the surrounding environment. Although there is growing awareness of the importance of environmental education, many schools in Indonesia, especially in remote areas, still face various challenges related to the condition of the environment, which is less conducive to the learning process.

The condition of the school environment in Indonesia still faces various challenges, even though efforts have been made to improve it. According to Syakur (2017), many schools, especially in remote and rural areas, face limitations in basic facilities such as adequate classrooms, access to clean toilets, and sports facilities. The lack of these facilities certainly affects the comfort and quality of the learning process. Cleanliness and health problems in the school environment are also significant challenges. Many schools do not have well-organized cleanliness programs, which result in unhealthy school environments. Furthermore, waste management in schools, especially in urban areas, is still not optimal. Many schools do not have an effective waste sorting system, which hinders children's awareness of the importance of sustainable environmental management.

Green open spaces in many schools are also limited, even though the presence of school gardens or parks can have a positive impact on children's physical, mental, and social development. Schools with gardens or parks often facilitate engaging nature-based learning activities. Although there is growing awareness of the importance of environmental education, the environmental education curriculum has not been fully implemented in all schools in Indonesia (Yulia Indahri, 2020).

Environmental education for early childhood, according to Wahyuni (2019), plays a vital role in fostering ecological awareness and naturalistic intelligence. Early childhood is a critical phase in a child's development, where they tend to have a strong curiosity and desire to explore their surroundings. Young children learn through direct interaction with their environment, so exposure to nature-based activities can enrich their experiences and instill values of care for the environment from an early age. At TK Pertiwi Panggung, TK Pertiwi Panggung is an early childhood education institution located in a rural area with a natural and green environment location in Surodadi Jepara. The school is known for its active implementation of environmentally-based learning activities, such as planting, maintaining cleanliness, and introducing children to the surrounding flora and fauna. This

was chosen as the research site because of its strong commitment to integrating environmental education into its daily learning activities. In addition, the availability of open green spaces and the support from both teachers and parents make TK Pertiwi Panggung an ideal setting for studying the development of naturalistic intelligence in early childhood through environmental-based learning.

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During these golden years of development, children need support from an environment that not only supports their physical health but also stimulates the development of various types of intelligence. According to Susanto (2020), one of the intelligences that can develop well through healthy environmental activities is naturalistic

intelligence, which is the ability to recognize and interact with the surrounding environment. Naturalistic intelligence in children allows them to be sensitive to their environment and understand natural elements such as plants, animals, weather, and natural cycles. In his book, he mentions that naturalistic intelligence is one of the key components that should be developed from an early age, so children can have a deep understanding of the environment and be able to care for nature with awareness.

In early childhood education in Indonesia, the development of naturalistic intelligence has become an important focus to shape a generation that is caring for the environment and capable of preserving the environment. One way to achieve this goal is by implementing healthy environment development activities at school, which not only support children's physical health but also foster their emotional, social, and intellectual development. Kindergarten (TK) plays a crucial role in shaping children's character and intelligence, including naturalistic intelligence. At TK Pertiwi Panggung, various healthy environment development activities have been implemented, such as school gardens, waste management, and the introduction of plants and animals around the school. These activities are designed to provide children with direct experiences in interacting with and understanding their environment (Zahriani Jf & Sukiman, 2020)

The formation of children's naturalistic intelligence in early childhood has a significant impact on their understanding of sustainability and environmental preservation concepts. Through direct interaction with the environment in a supportive school atmosphere, children can learn to love nature and feel responsible for maintaining environmental sustainability. This can also cultivate children's curiosity about natural phenomena around them. Healthy environment development activities at TK Pertiwi Panggung also play a role as a medium for introducing children to values of sustainability, cleanliness, and discipline in maintaining the environment. Additionally, by integrating these activities into daily lessons, children can more easily recognize the importance of maintaining cleanliness and environmental preservation. This, in turn, will form positive habits in children's everyday lives.

Previous research by Arip Saripudin (2017) showed that naturalistic intelligence can develop well through direct experiences and interactions with nature. For example, learning activities involving gardening, playing in the park, or exploring the surrounding environment significantly support children's observation and reflection skills regarding the environment. Similarly, a study by Setyaningsih et al (2024) emphasized that

environmental-based science education in early childhood improves children's ecological literacy and helps build positive environmental attitudes. Another study by Rachel Alice York, (2020) found that nature-oriented learning activities, such as waste sorting, composting, and nature walks, contribute effectively to the development of naturalistic intelligence and environmental responsibility in young children.

Therefore, healthy environment development activities at school can play an essential role in supporting the formation of children's naturalistic intelligence. However, in practice, not many educational institutions optimally implement healthy environment development as part of their curriculum. Some of the challenges faced include limitations in facilities and infrastructure, a lack of teacher knowledge about the importance of naturalistic intelligence, and insufficient support from parents. These conditions are also experienced at TK Pertiwi Panggung, where healthy environment development activities are still limited and not fully integrated into learning activities.

Analyzing the healthy environment development activities at TK Pertiwi Panggung is crucial to understanding how these activities impact the formation of children's naturalistic intelligence. Through this study, it is hoped that effective methods or approaches in these activities can be identified and further developed for implementation in other kindergartens. Based on the background above, this study aims to analyze how the healthy environment development activities at TK Pertiwi Panggung contribute to shaping children's naturalistic intelligence. The results of this research are expected to provide valuable insights for increasing awareness and involvement of stakeholders, including teachers, parents, and the local community, in supporting a healthy school environment conducive to children's development. Awareness of the importance of naturalistic intelligence is expected to foster a generation that is more concerned with the environment and able to contribute to efforts for environmental preservation in the future.

Methodology

This research mixed methods approach uses a qualitative approach with a case study method to analyze the healthy environment development activities at TK Pertiwi Panggung and their impact on the formation of naturalistic intelligence in early childhood. A qualitative approach was chosen because this study aims to gain a deep understanding of children's interactions with a healthy school environment and teachers' perceptions regarding the development of naturalistic intelligence (Hanyfah et al., 2022). The objective

of this study is to analyze the impact of school environmental development activities on the formation of naturalistic intelligence in children at TK Pertiwi Panggung. The researcher made thorough preparations for this study, both in terms of research design and research protocol.

Data was collected through in-depth interviews with teachers and school staff, direct observation of environmental development activities, and documentation of relevant activities. The interview subjects included 3 teachers, and the child subjects included 25 children. The interviews were conducted to explore the teachers' views and experiences regarding how children are facilitated in healthy environmental activities and how these activities contribute to the development of their naturalistic intelligence. Observations were made in natural settings while children engaged in nature-based activities, such as gardening and environmental exploration, to understand their naturalistic intelligence. The interviews consisted of two types of questions: general and specific. Observations also focused on the facilities and infrastructure available at TK Pertiwi Panggung.

For data analysis, the researcher employed thematic analysis, which involves steps of data reduction, coding, and identifying main themes relevant to the research objectives. The data collected through interviews and observations were analyzed to identify patterns and themes related to healthy environment activities and their impact on naturalistic intelligence. Coding was carried out by categorizing the data into related aspects, such as children's involvement, the connection of activities with nature, and the role of teachers in environmental development. After that, the researcher identified emerging themes, such as the theme of children's attachment to nature and the development of environmental care attitudes.

To ensure the validity of the data and maintain internal validity, triangulation was used. This technique combines interviews, observations, and document collection. The results of this analysis are expected to contribute to the development of more effective environment-based learning programs in early childhood education, particularly in the formation of children's naturalistic intelligence. The final step involves the dissemination of the research, which includes writing a research report and publishing the findings.

Results and Discussion

Results

The data indicates that the healthy environment development activities at TK Pertiwi Panggung have a positive impact on the formation of children's naturalistic intelligence. The results from interviews with the teachers show that children understand the importance of nature-based activities in fostering naturalistic intelligence in early childhood. According to the teachers, activities such as gardening, sorting waste, and environmental exploration help children to recognize, observe, and care for the natural elements around them. The teachers also reported that children who were actively involved in these activities displayed a high level of curiosity about the environment, such as asking the names of plants or animals they encountered. However, this finding would be more robust if supported by statistical data, such as the frequency of children's environmental inquiries, the number of plant or animal names they could recall before and after the activities, or pre- and post-activity assessments measuring their naturalistic intelligence. Quantitative evidence can help validate the observed behavioral changes and strengthen the conclusions drawn from the qualitative insights.

Table 1. Results of assess children’s curiosity and interaction with nature after participating in environmental development activities.

Name	Age	Gender	Question	Answer
R	4	Female	Does the child enjoy playing in natural environments (garden, park, forest)?	Yes, very much – loves exploring trees and flowers
D	6	male	Can the child identify common animals or plants (e.g., birds, flowers)?	Yes – can name birds and trees in the school garden
D	5	Male	Does the child ask questions about nature (e.g., weather, animals, plants)?	Often – frequently asks about why leaves fall
S	4	Female	Does the child show care for living things (e.g., pets, plants)?	Yes – waters the class plant daily

Table 2. Results of School Environment Development at TK Pertiwi Panggung.

No	Stimulation Given	Children's Response	Research Findings
1.	Introduction to plants and animals in the school environment	Children begin to recognize various types of plants and animals	Children show increased knowledge about the flora and fauna around the school environment.
2.	Gardening activities and caring for plants at school	Children show a sense of responsibility and enthusiasm	Children develop a caring attitude towards the environment and a desire to nurture plants.
3.	Assigning tasks to clean the school environment	Children actively participate in maintaining the cleanliness of the environment	Children exhibit healthy and clean living behaviors, as well as an increase in naturalistic intelligence through concrete actions.
4.	Nature observation activities (weather, plants, animals)	Children show interest and actively observe natural phenomena	Children begin to develop observational and analytical skills regarding the natural phenomena around them.
5.	Education on healthy lifestyles and personal hygiene	Children follow and apply healthy living behaviors	Children show improved understanding and behavior in maintaining personal hygiene and environmental cleanliness.
6.	Learning through educational games related to nature	Children learn while playing and enrich their knowledge	Children display creativity and naturalistic intelligence in identifying and understanding natural ecosystems.

Naturalistic intelligence, as explained in Daniah (2020), refers to an individual’s ability to recognize, understand, and categorize natural objects and phenomena around them. This intelligence includes the ability to distinguish between different types of plants, animals, and other natural phenomena, as well as understanding the relationships between elements in nature. More specifically, naturalistic intelligence relates to the ability to identify and interact with the natural world, such as recognizing plant and animal species, understanding weather patterns, or using natural resources wisely. People with high naturalistic intelligence often show a deep interest in ecosystems and tend to have extensive knowledge about the natural world. This intelligence is considered important because it allows individuals to connect knowledge about nature with actions that support environmental sustainability and conservation.

Observations during the activities showed that children were enthusiastically engaged in activities that introduced them to nature. For example, during gardening activities, children planted, watered, and observed the growth of plants over time. Children showed curiosity about natural processes, such as photosynthesis and the basic needs of plants, which the teachers explained in simple terms. Additionally, children were taught to sort organic and inorganic waste, helping them understand the importance of cleanliness and environmental conservation. These activities strengthened their observation skills and helped develop a sense of responsibility toward the environment. This is consistent with research from Nova (2021), which found that children who participated in environmental care activities showed higher awareness of cleanliness.

Data analysis revealed that the healthy environment development activities at the school contributed to the formation of a caring attitude toward the environment and social responsibility in children. Teachers observed that after some time, the children became more aware of behaviors such as disposing of trash properly and not damaging plants. According to Hariandi et al., (2023), nature-based activities like these can foster a love for nature and environmental care habits from an early age. However, the study also found some challenges in implementing the activities. One of the main challenges was the limited space at the school, which affected the scale of gardening activities. The teachers addressed this by using pots and polybags as alternative planting media.

Table 2. Achievement of Naturalistic Intelligence Indicators.

Naturalistic Intelligence Indicators	Number of Children Achieving BSH	Percentage (%)
Recognizing and naming natural objects	20	80%
Showing concern for the environment	18	72%
Feeding animals	21	84%
Caring for plants in the school garden	20	80%
Enjoying learning outdoors	23	92%

Another challenge was the lack of supportive involvement from some parents, as they were not fully aware of the importance of environmental development programs for children’s growth. This affected children’s participation at home, although the school made efforts to provide additional understanding to parents. Information was shared through

class WhatsApp groups as a means of socializing the characteristics of naturalistic intelligence and how to facilitate children at home. The goal was to increase knowledge of nature, build caring character, enhance physical and mental health, and foster creativity.

However, this finding would be more valid and compelling if supported by statistical data. For example, data could be gathered on the number or percentage of parents who actively read or responded to environmental messages in the WhatsApp group, how many implemented suggested nature-based activities at home, or changes in children's home-based engagement (as reported by parents) before and after school outreach efforts. Additionally, a simple pre- and post-intervention questionnaire for parents could measure changes in their awareness and attitudes regarding environmental education. These data would help quantify the level of parental involvement and provide clearer insights into the effectiveness of school-home communication strategies. The goal was to increase knowledge of nature, build caring character, enhance physical and mental health, and foster creativity.

Overall, the healthy environment development activities at TK Pertiwi Panggung proved to be effective in enhancing children's naturalistic intelligence. These activities helped children to recognize and appreciate nature, strengthened their observation skills, and built a caring attitude toward the environment. With additional support and improvements, these activities are expected to contribute long-term to the development of children's intelligence and character, especially in building a generation that is more caring and responsible toward the environment.

Discussion

The school environment plays a significant role in shaping the naturalistic intelligence of young children. In the context of early childhood education, the development of naturalistic intelligence is highly relevant, given that children at this age possess a strong curiosity about their surrounding environment. At TK Pertiwi Panggung, activities that promote a healthy environment involve various interactions between children and nature (Afrianingsih et al., 2019). These activities aim to help children recognize, understand, and appreciate elements of nature and the life cycles around them. For instance, through gardening activities, children learn to identify different types of plants, understand their needs, and witness the growth process. This is an effective way to foster a love for the environment and enrich children's knowledge of nature.

According to Howard Gardner's theory of multiple intelligences, naturalistic intelligence is the ability to recognize flora, fauna, and other elements of nature, as well as to distinguish between different species. Gardner suggests that naturalistic intelligence is an inherent ability that needs to be stimulated to develop optimally. In this regard, a school environment designed to provide children with opportunities to interact with nature can serve as an important platform for the development of this intelligence. Through environmental health activities, TK Pertiwi Panggung has provided a space for children to nurture their naturalistic intelligence. Children engaged in nature-based activities indirectly develop skills in observation, environmental awareness, and responding to changes in their surroundings.

The healthy environmental development activities at TK Pertiwi Panggung not only enhance naturalistic intelligence but also encourage environmental awareness among children. For example, children are taught to sort waste into organic and inorganic categories, a simple activity that provides an initial understanding of the importance of cleanliness and everyone's role in preserving the environment. Research shows that waste sorting at schools can increase children's awareness of the importance of maintaining a clean environment. This research suggests that children involved in waste sorting are more likely to dispose of trash properly, even outside of school.

In addition to waste sorting, TK Pertiwi Panggung also involves children in gardening activities. This activity not only teaches children about the growth process of plants but also introduces them to the responsibility of caring for them. Children learn to water the plants regularly and monitor their condition, which helps them understand the importance of nurturing living beings. Thus, gardening activities not only increase children's knowledge of nature but also instill attitudes of care and responsibility towards the environment. Studies have shown that children involved in gardening develop a stronger sense of environmental care and a lasting love for nature.



Pict1. Children are taught to sort waste in to organic



Pict 2. Children are taught to sort waste in to inorganic

The healthy environmental development activities at school not only impact children's naturalistic intelligence but also contribute to character development. Children who are taught to care for the environment through activities such as gardening, waste sorting, and maintaining cleanliness indirectly learn empathy, discipline, and responsibility. For instance, taking care of plants in the school garden teaches children about discipline, as they must water the plants regularly for them to grow well. Empathy is also nurtured when children understand that plants, as living beings, need care just like humans. In other words, these activities foster the awareness that the environment requires attention and collective responsibility.

According to research Afrianingsih (2023) environment-based learning, such as gardening and environmental maintenance, can more effectively develop a child's character than conventional learning methods. This is because children not only learn the theory but also experience it firsthand. For example, when children see a plant wilting due to lack of water, they directly understand the importance of water for plants and the consequences of neglect. Thus, experience-based learning through environmental health activities not only enhances naturalistic intelligence but also helps shape children's character to be more conscious of and responsible for the environment.

Although the healthy environmental development program at TK Pertiwi Panggung shows positive impacts, there are several challenges in its implementation. One of the main challenges is the limited space available for gardening activities. With limited space, the school must be creative in utilizing the available area, such as using pots or polybags to

plant various types of plants. Teachers also state that time constraints pose challenges, especially because the curriculum at kindergarten is often packed with other activities. This leads to limited time for environmental activities, preventing children from interacting with the natural environment in a deep and sustained manner.

In addition to space and time limitations, parental support is also a challenge in implementing the healthy environmental activities at school. Some parents may not fully understand the importance of environmental health activities for children's development, so their children's participation in nature-related activities might be limited. However, parental involvement is crucial to reinforcing children's experiences at home, especially in instilling environmental care habits. Support from parents in fostering cleanliness habits at home can help children better understand the values taught at school. Research has shown that parental and community support is a key factor in the success of environment-based programs at school.

The healthy environmental development activities at TK Pertiwi Panggung have positive implications for the development of young children, especially in terms of environmental education. Through these activities, children have the opportunity to learn directly from their surrounding environment, which is different from classroom-based learning. Environment-based learning allows children to see, feel, and experience natural processes, such as plant growth, weather changes, and the diversity of living organisms. This experience not only enriches children's knowledge but also strengthens their understanding of ecosystems and biodiversity.

Environment-based learning also fosters children's interest in exploring nature and encourages active involvement in outdoor activities. Several teachers at TK Pertiwi Panggung reported that after participating in gardening and waste sorting activities, children often expressed interest in inviting their parents to garden at home or clean the yard. This shows that environment-based activities at school have an impact on children's lives outside of school, helping to form habits and attitudes of care towards nature. Children's involvement in environmental activities at home not only strengthens their understanding of responsibility for nature but also contributes to building an environmentally conscious mindset that they will carry with them into adulthood.

Closing

Based on the discussion above, it can be concluded that the healthy environmental development activities at TK Pertiwi Panggung have a significant impact on the development of children's naturalistic intelligence and the formation of an environmentally conscious character. Through activities such as gardening, waste sorting, and maintaining cleanliness, children learn to observe nature, understand the needs of living beings, and develop a sense of responsibility and love for the environment. Although there are several challenges, such as limited space, time constraints, and parental support, these activities still make a positive contribution to the development of young children.

To improve the effectiveness of this program, several strategic steps are needed. First, the school can collaborate with environmental organizations or communities to provide facilities and resources that can support nature-based activities. Second, the school can involve parents in the environmental development program by educating them about the importance of their role in supporting the development of children's naturalistic intelligence at home. In this way, it is hoped that the healthy environmental development will not only impact children's lives at school but also shape their mindset and character to care for the environment, which they will carry into adulthood.

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