



Fostering Naturalistic Intelligence in Early Childhood: An Exploratory Study of Learning Strategies, Practices, and Developmental Outcomes

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Abstract: This study aims to describe the development of naturalist intelligence among early childhood learners at KB Titian Sejahtera, Muaro Jambi Regency, by examining learning implementation, instructional strategies, learning activities, supporting and inhibiting factors, and developmental outcomes. The study employed a qualitative descriptive approach. The participants consisted of the school principal, two teachers, and 26 children. Data were collected through classroom observations, semi-structured interviews, and document analysis. Data credibility was ensured through source, method, and time triangulation, while data were analyzed using data reduction, data display, and conclusion drawing and verification. The findings indicate that naturalist intelligence was systematically developed through nature-based learning by utilizing the school environment as a primary learning resource. Teachers implemented outdoor learning, environmental exploration, play-based learning, and the use of natural materials such as leaves, flowers, stones, and seeds. Supporting factors included a conducive school environment, teacher creativity, institutional support, and children's enthusiasm, whereas limited learning materials, weather conditions, time constraints, and insufficient parental involvement were identified as major challenges. The findings further demonstrate that this approach not only enhances children's ability to recognize and classify natural objects but also fosters environmental awareness and responsibility. Moreover, the effective use of the school environment as a learning resource highlights the potential of place-based education and ecopedagogy as meaningful approaches to early childhood education, particularly in rural settings with limited access to digital technologies and modern educational facilities.

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Introduction

Early childhood education is an important stage in optimizing all aspects of child development, including multiple intelligences. According to Gardner (1983), naturalist intelligence is the ability to recognize, distinguish, classify, and show concern for nature and the living things around it. This intelligence needs to be developed from an early age because it not only increases children's knowledge about the environment, but also forms ecological awareness, a sense of responsibility, and an attitude of concern for environmental sustainability. The development of naturalist intelligence is also supported by the Biophilia Hypothesis put forward by Wilson (1984), which states that humans have an innate tendency to interact with nature so that direct experience in the environment plays an important role in the cognitive, emotional, and social development of children. Therefore, early childhood education needs to provide opportunities for children to learn through real experiences in the surrounding environment. This approach is in line with the concept of Place-Based Education (PBE) which places the local environment as the main context of learning (Sobel, 2004), as



well as ecopedagogy which emphasizes the formation of ecological awareness through contextual and transformative educational processes (Kahn, 2010). In the context of rural areas that have limited digital facilities and modern learning media, the use of the surrounding environment as a learning resource is an effective alternative to develop naturalistic intelligence while instilling concern for the environment from an early age.

Previous research shows that naturalist intelligence can be developed through various approaches, such as nature-based learning (Fitria et al., 2024), outdoor learning (Sari et al., 2023), the use of learning media such as Animals Suitcase and Busy Book (Rizkina et al., 2023; Sunardi & Kurniastuti, 2022; Ulfa et al., 2024), as well as environmental exploration activities, life science, messy play, mosaics made of nature, and tourism works (Gumitri & Suryana, 2022; Azizah Destarani et al., 2020). These findings show that the environment is an effective source of learning in developing early childhood naturalist intelligence.

However, most research focuses on specific learning methods, media, or models. Studies that comprehensively describe the implementation of naturalist intelligence development in daily learning in PAUD institutions are still limited, especially in educational units that utilize the potential of the local environment as a learning resource and there has not been a specific study that examines the development of naturalist intelligence in KB Titian Sejahtera, Muaro Jambi Regency by examining learning planning, teacher strategies, supporting and inhibiting factors, and the results of its development in an integrated manner.

Based on these conditions, this study offers a novelty in the form of a comprehensive analysis of the implementation of naturalist intelligence development through environment-based learning at KB Titian Sejahtera, Muaro Jambi Regency. In addition to identifying the learning strategies implemented by teachers, the research also analyzes the relationship between the use of the school environment, institutional support, and the development of children's naturalistic intelligence as a unit of the learning process. The findings of this research are expected to be a reference in the development of learning in early childhood education institutions.

Research Method

This study uses a descriptive method with a qualitative approach to describe the development of early childhood naturalist intelligence in KB Titian Sejahtera, Muaro Jambi Regency. The research was carried out in May-June 2026 with researchers as the main instrument that plays a role in data collection, processing, and interpretation. The research subjects consisted of 1 principal, 2 teachers, and 26 students. Students are the subjects of observation, while informants, namely principals and teachers who are directly involved in planning, implementing, and assessing learning are selected through purposive sampling techniques. Data collection was carried out using semi-structured interview methods, documentation studies, and observations. The observations used were non-participant observations to observe the implementation of children's learning and behavior that showed indicators of naturalistic intelligence; interviews were conducted with school principals and teachers to obtain information about learning strategies as well as supporting and inhibiting factors; while documentation includes school profiles, teaching modules, Daily Learning Implementation Plans (RPPH), photos of activities, children's work, and other supporting documents. Based on the indicators of early childhood naturalist intelligence, research instruments were prepared in the form of observation guidelines, interview guidelines, and data recording guidelines.

**Table 1. Research Subjects**

Informants	Quantity	Remarks
Principal	1	Key informants
Teacher	2	Key informants
Students	26	Subject of observation

Triangulation of sources, methods, and time is used to assess the validity of the data. Data analysis uses the Miles and Huberman paradigm (as cited in Sugiyono, 2013), which includes the stages of data reduction, data presentation, and conclusion formulation and verification. Data reduction involves selecting and organizing data based on the focus of the research, followed by presenting information in a narrative manner to facilitate understanding before verification to produce reliable findings.

Results and Discussion

Development of Early Childhood Naturalist Intelligence Through Environment-Based Learning

The results of the study show that the development of naturalist intelligence in KB Titian Sejahtera, Muaro Jambi Regency is carried out in a planned manner through environment-based learning that is integrated into daily learning activities. Based on the results of observations, teachers consistently use the school environment as a learning resource by inviting children to observe various types of plants, get to know animals around the school, identify weather changes, and take care of plants in the school yard. This activity provides an opportunity for children to gain hands-on learning experience so that concepts about nature are understood through real interaction with the environment.

The findings of these observations were strengthened by the results of the interview with Teacher 1 who stated:

"We often invite children to learn outside the classroom because they are easier to understand if they see plants or animals around the school directly. Children are also more enthusiastic than when they only use pictures." (Teacher 1)

The statement shows that teachers view the school environment as a more effective learning medium than learning that only relies on visual media in the classroom. The principal also revealed that the use of the environment has become part of the school's policy in supporting early childhood learning.

"Schools give teachers the flexibility to use the school yard as a learning place because the surrounding environment is the closest source of learning to children's lives." (Principal)

The results of the observation also showed that most of the children were able to recognize various types of plants found in the school environment, distinguish the shape and size of the leaves, mention several types of animals that are often found, and show the habit of watering plants and throwing garbage in their place. During the learning activities, children seem to be actively observing objects introduced by the teacher, asking simple questions, and discussing with friends about the results of their observations. The findings show that environment-based learning not only develops the ability to recognize natural objects, but also builds concern for the environment through habituation that is carried out repeatedly.

These findings show that hands-on learning experiences provide children with the opportunity to build knowledge through interaction with the environment. This process



strengthens children's ability to observe, compare, classify, and understand the characteristics of natural objects in accordance with the stages of early childhood thinking development that are still concrete. The results of this study are in line with the theory of Multiple Intelligences put forward by Gardner (1983), which explains that naturalistic intelligence develops through experience in recognizing, classifying, and understanding natural phenomena. In addition, these findings also support the Biophilia Hypothesis of Wilson (1994), which states that humans have a natural tendency to interact with nature so that direct experience with the environment contributes to the cognitive, emotional, and social development of children.

The findings of this study are in line with the research of Fitria et al. (2024), which states that nature-based learning is able to improve children's ability to recognize the environment while fostering concern for nature. Research by Sari et al. (2023) also shows that *outdoor learning* can improve the observation and exploration skills of early childhood. However, this study has a different contribution because it not only highlights the effectiveness of one learning method, but describes comprehensively how the development of naturalistic intelligence is built through the integration of the use of the school environment, teacher strategies, habituation of environmentally caring behaviors, and active involvement of children in the learning process.

Overall, the findings of the study show that the school environment has a strategic role as a learning laboratory for the development of early childhood naturalist intelligence. Through authentic and contextual learning experiences, children not only gain knowledge about the environment, but also develop an attitude of care and responsibility towards nature from an early age.

Teachers' Strategies in Developing Early Childhood Naturalist Intelligence

The results of the study show that teachers at KB Titian Sejahtera apply various learning strategies to develop children's naturalist intelligence, namely environment-based learning, outdoor learning, nature exploration activities, play while learning, and the use of natural materials as learning media. The strategy is tailored to the characteristics of early childhood who learn more effectively through hands-on experience and activities involving the surrounding environment.

Based on the results of observations, learning does not only take place in the classroom, but also uses the school yard as a learning space. The teacher invites the child to observe plants, get to know the parts of the plant, identify insects and small animals, and observe the changes in the weather. During the activity, the teacher gives simple questions that encourage children to observe, compare, and convey the results of their observations. This approach makes children more active in exploring the environment and building their knowledge through hands-on experience. The findings are reinforced by the following statement of Master:

"If we learn about plants, we invite children to the school yard. Children can see, hold, and even compare the shape of the leaves. They become easier to understand than just looking at pictures." (Teacher 1)

Teacher 2 also explained that the use of the surrounding environment was chosen because it was more in line with the characteristics of early childhood learning.

"Children are happier if they learn while playing outside the classroom. They can ask questions, find the object they have asked for, and then retell what they found." (Teacher 2)

In addition to utilizing the school environment, teachers use various media derived from nature, such as leaves, flowers, stones, twigs, and grains. Based on the results of



observations, the media is used in various activities, such as grouping leaves based on shape and size, making collages from natural materials, matching grains, and caring for plants. These activities not only develop the ability to observe and classify natural objects, but also train fine motor coordination, simple problem-solving skills, and children's creativity.

Teacher 1 explained that the use of natural media is done because it is easy to obtain and able to attract children's attention.

"We use anything around the school, such as leaves, flowers, or stones. Children are more interested because they can touch and observe the object directly." (Teacher 1)

The findings of this study show that the success of the development of naturalist intelligence is not only determined by certain learning methods, but also by the ability of teachers to design contextual and meaningful learning experiences. The teacher acts as a facilitator who provides opportunities for children to explore the environment, ask questions, try, and conclude observations. Through this process, children build knowledge based on real experience, in accordance with the principles of constructivistic learning that place experience as the basis for knowledge formation.

The results of this study are in line with the research of Gunitri and Suryana (2022) who stated that nature-based learning is able to provide an authentic learning experience for early childhood. Research by Hakiki (2021) also showed that the method of tourism work is effective in increasing the intelligence of naturalists through direct experience, while Azizah Destarani et al. (2020) found that environmental exploration can develop children's observation and classification skills. In contrast to these studies, the results of this study show that the development of naturalist intelligence does not depend on one learning method, but is the result of the integration of various strategies that are adjusted to the learning theme, environmental conditions, and the needs and characteristics of students.

Overall, the strategies implemented by teachers show that the use of the school environment as a learning resource is able to create active, contextual, and meaningful learning. Teachers' creativity in integrating *outdoor learning*, environmental exploration, playing while learning, and the use of natural media provides opportunities for children to develop the ability to recognize, understand, and care for the environment optimally from an early age.

Supporting and Inhibiting Factors for the Development of Early Childhood Naturalist Intelligence

The results of the study show that the success of the development of naturalist intelligence in KB Titian Sejahtera is influenced by various interrelated factors, both those that support and hinder the implementation of environment-based learning. Based on the results of observations, interviews, and documentation, the main supporting factors include a conducive school environment, teachers' creativity in utilizing the environment as a learning medium, support from the school, and children's enthusiasm during learning activities. On the other hand, inhibiting factors include uncertain weather conditions, limited learning media, limited time, and not optimal parental involvement in providing naturalist intelligence stimulation at home.

The school environment is the most dominant supporting factor. Based on the results of observations, the school has a yard overgrown with various types of plants so that it can be used as a learning resource on various learning themes. The existence of this environment allows teachers to invite children to observe plants, recognize various leaf shapes, identify small animals, and carry out plant care activities without the need for complex additional facilities. The findings were strengthened by the Principal's statement as follows:



"Our school environment is indeed the main learning medium. Teachers are given the freedom to use the school yard so that children can have a hands-on learning experience." (Principal)

In addition to the school environment, teacher creativity is also an important factor in supporting the development of naturalist intelligence. The results of the observation showed that teachers were able to utilize various materials available in the surrounding environment, such as leaves, flowers, twigs, stones, and grains, as learning mediums. The use of this simple media makes learning activities continue to take place in an interesting way even though schools have limitations in modern learning media. The findings are reinforced by teacher 1's statement explaining that:

"If props are not available, we use objects around the school. The important thing is that children can still see and hold objects directly." (Teacher 1)

These findings show that teachers' creativity plays an important role in creating contextual learning. The ability of teachers to manage available learning resources allows the learning process to continue effectively even though the facilities owned by schools are still limited.

Another supporting factor is school support for the implementation of environment-based learning. Based on the results of the interviews, the principal gave teachers the flexibility to carry out learning outside the classroom and supported various habituation programs to maintain environmental cleanliness. This support creates a school culture that encourages children to get used to interacting with the environment as part of daily learning activities.

Children's enthusiasm is also one of the factors that support learning success. During observation, children were seen actively observing natural objects, asking questions, discussing with friends, and participating in various exploration activities given by teachers. The high curiosity of children shows that environment-based learning is in accordance with the characteristics of early childhood learning which prefers exploratory activities to passive learning.

On the other hand, this study also found several factors that hinder the implementation of the development of naturalist intelligence. One of the main obstacles is the unpredictable weather conditions. Based on the observation results, learning activities outside the classroom cannot be carried out when it rains or the weather is too hot, so teachers have to move activities into the classroom. This condition caused some exploration activities to not be carried out optimally. The findings were reinforced by teacher 2's statement revealing that:

"If it rains, activities outside the classroom are forced to be canceled. Finally we use images or videos as a substitute, but the child's learning experience is certainly different than when they see objects in person." (Teacher 2)

The limitation of learning media is also one of the obstacles. Although the school environment provides a variety of natural objects, not all learning materials can be supported by the available media. Therefore, teachers need to adapt learning activities to environmental conditions or use alternative media as needed.

In addition, limited learning time is a challenge in the implementation of environment-based activities. Based on the results of observations, exploration activities take longer because teachers must condition children, provide directions, accompany the observation process, and reflect after the activity is completed. As a result, not all exploration activities can be carried out in depth at every meeting.



The study also found that parental involvement in developing naturalist intelligence must be optimal. The teacher explained that at home parents must get used to children maintaining environmental cleanliness or introducing various types of plants at home, but some still consider learning about the environment to be the responsibility of the school. The findings were strengthened by the statement of teacher 1 who said:

"If at school children are used to taking care of plants, but at home the activity is not necessarily continued, some other parents still consider learning about the environment to be the responsibility of the school. Parental support still needs to be improved so that children's habits are more consistent." (Teacher 1)

These findings suggest that the development of naturalistic intelligence requires collaboration between schools and families. Habituation that is carried out consistently in both environments will strengthen the child's learning experience and help form an attitude of caring for the environment.

The results of this study are in line with the research of Sunardi and Kurniastuti (2022) which states that the success of the development of naturalist intelligence is influenced by a supportive learning environment and the creativity of teachers in managing learning. Research by Ulfa et al. (2024) also shows that the use of the environment as a learning medium is able to increase children's involvement in the learning process. On the other hand, Hakiki's research (2021) revealed that weather conditions and limited facilities are obstacles that are often faced in environment-based learning. This study expands on these findings by showing that family support is an equally important factor in ensuring the sustainability of the development of children's naturalistic intelligence.

Overall, the results of the study show that the development of naturalist intelligence is the result of the interaction of various factors that affect each other. The school environment, teacher creativity, institutional support, and children's enthusiasm are the main capital in the implementation of environment-based learning. On the other hand, weather conditions, limited media and time, and lack of optimal parental involvement are challenges that need to be overcome through cooperation between schools, families, and the community so that the development of naturalist intelligence can take place continuously.

The Impact of Naturalist Intelligence Development on Early Childhood Development

The results of the study show that the implementation of environment-based learning in KB Titian Sejahtera has a positive impact on the development of early childhood naturalist intelligence. This impact can be seen in the increase in children's ability to recognize and group natural objects, the development of an attitude of concern for the environment, increased curiosity, and the development of communication and cooperation skills during learning activities.

Based on the results of observations, most of the children have been able to name various plants found in the school environment, distinguish the shape, size, and color of leaves, recognize several types of animals that are often found, and group natural objects based on certain characteristics. During learning activities, children also seem to be more active in observing the environment, asking questions, and conveying the results of their observations to teachers and friends. The findings are strengthened by the following statement of Teacher 1.

"Now children are easier to recognize plants around the school. They often mention the names of the plants before I ask, and even explain them to their friends." (Teacher 1)



In addition to the development of the ability to recognize natural objects, the results of observations show that there is a change in children's behavior towards the environment. Children are getting used to throwing garbage in their place, watering plants without being asked, and reminding friends not to damage plants or disturb animals in the school environment. These changes show that environment-based learning not only improves the aspect of knowledge, but also forms an attitude of care and responsibility towards the environment. This explanation is reinforced by teacher 2's statement that:

"If there is a friend who picks flowers carelessly, usually other children immediately remind them. They are beginning to understand that plants must also be taken care of." (Teacher 2)

The principal also said that the change in behavior was seen in daily activities at school.

"We see children becoming more concerned about the environment. They are used to watering the plants, keeping the yard clean, and having fun learning outside of the classroom." (Principal)

In addition, environment-based learning also has an impact on children's social development and communication skills. Based on the observation results, exploration activities are carried out in groups so that children learn to discuss, exchange opinions, work together, and convey the results of observations to friends. The interaction showed that the development of naturalistic intelligence also contributes to the development of children's language and social skills.

These findings show that environment-based learning provides a holistic learning experience. Children not only gain knowledge about nature, but also build thinking skills, caring for the environment, communication skills, and the ability to work together through direct experience. The process is in accordance with a constructivist approach that views that knowledge is built through active interaction with the environment. Concrete learning experiences allow children to understand concepts more deeply than learning that is only verbal.

The results of this study are in line with the research of Priadi and Fatria (2024) which states that environmental education in early childhood is able to improve the ability to recognize nature while forming the character of caring for the environment. Research by Wijaya and Dewi (2021) also shows that environment-based learning can develop naturalist intelligence through direct interaction with natural objects. In addition, Susanti et al. (2025) explained that the success of the development of naturalist intelligence is shown not only by the ability to recognize natural objects, but also by the emergence of behaviors to protect and preserve the environment in daily life.

However, this study makes a different contribution compared to previous research. Most previous research has focused on the effectiveness of a single method or learning medium in improving naturalist intelligence. On the contrary, this study shows that the development of naturalist intelligence is the result of the integration of various learning components, including the use of the school environment, teacher creativity, habituation of environmental care behavior, school support, and active involvement of children during the learning process. Thus, the development of naturalist intelligence is understood as a process that takes place continuously through learning experiences that are integrated into daily activities.

Overall, the results of the study show that environment-based learning not only develops children's ability to recognize and understand nature, but also shapes environmental



care attitudes, social skills, and communication skills. These findings confirm that the school environment can function as an effective learning laboratory to support the development of early childhood naturalist intelligence, especially in educational units in rural areas that have limited digital facilities and modern learning media.

Conclusion

The results of the study show that the development of naturalist intelligence is carried out in a planned manner through nature-based learning by utilizing the school environment as a learning resource. Teachers apply outdoor learning strategies, environmental exploration, play while learning, and the use of natural media such as leaves, flowers, stones, and grains. Supporting factors include a conducive school environment, teacher creativity, school support, and children's enthusiasm, while inhibiting factors include limited learning media, weather conditions, time constraints, and suboptimal parental involvement. This development not only improves children's ability to recognize and classify natural objects but also fosters concern for the environment, and the use of the school environment as a learning resource which is a form of effective place-based education and ecopedagogy, especially in rural areas with limited digital facilities and modern learning facilities.

Recommendation

Based on the findings of the research, several recommendations were submitted for teachers and PAUD leaders. Teachers are encouraged to improve their competence in designing contextual and child-centered environment-based learning. PAUD leaders should be able to facilitate training, mentoring, and periodic evaluations to support the implementation of environment-based learning in a sustainable manner. For further research, it is recommended to examine the development of early childhood naturalist intelligence through a broader approach, not only descriptive but also experimental or mixed methods, by involving more PAUD institutions so that the results are more comprehensive and examining the role of parents in stimulation at home.

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