

THE PRINCIPAL'S GREEN TRANSFORMATIONAL LEADERSHIP PRACTICES IN SUPPORTING ENVIRONMENT-BASED LEARNING IN KINDERGARTEN

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Abstract

Environment-based learning in kindergarten requires leadership capable of integrating an ecological vision into everyday learning practices. Green Transformational Leadership has been widely studied in the context of organizations and public schools, but its application to PAUD, particularly in environment-based learning in rural kindergartens, has not been widely explored. This study aims to analyze the principal's Green Transformational Leadership practices in supporting environment-based learning at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten. A qualitative approach with a case study design was employed. Data were collected through semi-structured interviews with the principal and two teachers, observations, and documentation. Data analysis was conducted through data condensation, data presentation, and drawing conclusions. Data validity was tested through triangulation of sources and techniques. The findings indicate that the principal implemented Green Transformational Leadership through four principal practices: translating the school vision into directions for learning, modeling environmentally responsible behavior, encouraging teachers' creativity in utilizing natural and waste materials, and facilitating reflection while supporting teachers' ideas and addressing their challenges. These practices supported the use of the surrounding environment as a learning resource while strengthening children's habituation to environmentally responsible behavior. This study demonstrates that Green Transformational Leadership contributes to the utilization of the surrounding environment as a concrete, accessible, and meaningful learning resource for young children.

Keywords: *Environment-based learning; Green Transformational Leadership; kindergarten; principal.*

**PRAKTIK GREEN TRANSFORMATIONAL LEADERSHIP KEPALA SEKOLAH
DALAM MENDUKUNG PEMBELAJARAN BERBASIS LINGKUNGAN DI TAMAN
KANAK-KANAK**

Abstrak

Pembelajaran berbasis lingkungan di taman kanak-kanak memerlukan kepemimpinan yang mampu mengintegrasikan visi ekologis ke dalam praktik pembelajaran sehari-hari. Green Transformational Leadership telah banyak dikaji dalam konteks organisasi maupun sekolah umum, tetapi penerapannya pada PAUD, khususnya dalam pembelajaran berbasis lingkungan di taman kanak-kanak pedesaan, belum banyak dieksplorasi. Penelitian ini bertujuan menganalisis praktik Green Transformational Leadership kepala sekolah dalam mendukung pembelajaran berbasis lingkungan di TK Pertiwi Eka Tunas Bhakti Wanacipta. Digunakan pendekatan kualitatif dengan desain studi kasus. Pengumpulan data melalui wawancara semi-terstruktur dengan kepala sekolah dan dua orang guru, observasi dan dokumentasi. Analisis data dilakukan melalui kondensasi data, penyajian data, dan penarikan kesimpulan. Uji keabsahan data melalui triangulasi sumber dan teknik. Temuan menunjukkan bahwa kepala sekolah menerapkan Green Transformational Leadership melalui empat praktik utama, yaitu menerjemahkan visi sekolah ke dalam arah pembelajaran, memberikan keteladanan dalam perilaku peduli lingkungan, mendorong kreativitas guru dalam memanfaatkan bahan alam dan limbah, serta memfasilitasi refleksi dan memberikan dukungan terhadap gagasan maupun kendala guru. Praktik tersebut mendukung pemanfaatan lingkungan sekitar sebagai sumber belajar sekaligus memperkuat pembiasaan perilaku peduli lingkungan pada anak. Penelitian ini menunjukkan bahwa Green Transformational Leadership berkontribusi terhadap pemanfaatan potensi lingkungan sekitar sebagai sumber belajar yang konkret, terjangkau, dan bermakna bagi anak usia dini.

Kata kunci: Green Transformational Leadership; kepala sekolah; pembelajaran berbasis lingkungan; taman kanak-kanak

INTRODUCTION

Sustainability has become a global issue, driving a paradigm shift in various sectors, including education. This situation emphasizes the importance of Education for Sustainable Development (ESD), namely education that equips students with the knowledge, skills, values, attitudes, and behaviors to contribute to environmental, social, and economic sustainability (UNESCO, 2020). The implementation of ESD in early childhood education is crucial because values, habits, and concern for the environment begin to form early in a child's development (Ohlsson et al., 2024). The urgency is even stronger considering that climate-related disasters have disrupted the education of at least 242 million students in 85 countries throughout 2024 (UNICEF, 2025). Therefore, early childhood education institutions need to introduce environmental awareness through learning, role modeling, and developmentally appropriate habits (Abo-khalil, 2024; Imran et al., 2024; Kumar & Kumar, 2023).

Instilling environmental awareness is crucial from early childhood education, as this period plays a crucial role in the development of children's thinking, values, attitudes, and habits (Haingu & Pingge, 2025). In a constructivist approach, children build understanding through active involvement, social interaction, and direct experience with their surroundings (Fragkiadaki et al., 2021). This process can be reinforced through role models and children's involvement in routine activities, thereby fostering environmentally friendly habits in everyday life (Kahriman-Pamuk & Samuelsson, 2024). Cultivating environmental awareness needs to be realized through concrete activities that provide opportunities for children to participate and interact directly with nature (Güler Yıldız et al., 2021). Therefore, caring for plants, utilizing

natural materials, maintaining cleanliness, and sorting waste can be a means of developing environmentally friendly knowledge and habits from an early age.

One relevant approach is environment-based learning, which positions the environment as a learning resource, medium, and context. This approach is associated with ecopedagogy, which emphasizes the development of understanding, awareness, and life skills aligned with environmental sustainability (Yunansah & Herlambang, 2017). At the kindergarten level, such learning can be implemented through the use of natural materials, outdoor activities, environmental observation, and the habituation of environmentally responsible behavior. In addition to introducing children to their environment, these experiences can support sensory development, creativity, and ecological intelligence (Dwiantari, 2025; Gandana et al., 2025). When implemented in a planned and consistent manner, environment-based learning can provide a foundation for developing environmentally responsible behavior (Lülfs & Hahn, 2014).

The implementation of environmental-based learning relies not only on teacher creativity and the availability of learning resources. Teachers play a direct role in internalizing environmental values through learning, habituation, interaction, and role modelling (Syahri & Prasetyo, 2024). However, the sustainability of these practices is also determined by the leadership of the principal. The principal holds a strategic position in formulating the vision, determining policies, allocating resources, supporting teacher development, and building a school culture (Na'im, 2022). Without clear direction and evaluation, environmental programs risk not being integrated into the school's work plan, curriculum, participatory activities, and follow-up (Suryani & Dafit, 2022). A lack of principal support for providing facilities, improving teacher understanding, and consistently instilling habits can also hinder the formation of a culture of environmental awareness (Sugiharto & Senen, 2025). Without such support, environmental-based learning has the potential to become incidental or dependent solely on the initiative of a particular teacher.

Transformational leadership is relevant in this context because it positions leaders as agents of change through a shared vision, motivation, innovation, and the participation of organizational members. In school settings, transformational leadership can strengthen organizational culture, collaboration, and the development of instructional innovation (Azmaniar et al., 2025; Mutoharoh & Herlina, 2025). In kindergartens, it can be implemented through teacher mentoring, reinforcement of shared goals, and support for instructional creativity (Ambawani et al., 2024). Nevertheless, transformational leadership in general does not always place ecological sustainability at the center of school transformation.

Green Transformational Leadership is an extension of transformational leadership that integrates ecological orientation into a leader's vision, role modeling, inspirational motivation, intellectual stimulation, and individualized consideration (Amruddin et al., 2020). In educational contexts, principals who implement Green Transformational Leadership not only communicate an environmental vision but also provide examples, motivate teachers, encourage instructional innovation, provide support, and build a collective commitment to sustainability. Several studies have shown that this form of leadership can promote green creativity, pro-environmental behavior, innovation, and the strengthening of a sustainability-oriented organizational identity (Bahzar, 2019; Jani, 2023; Shiferaw et al., 2025).

Studies of transformational leadership and sustainable education have extensively addressed policies, school programs, organizational behavior, green creativity, innovation, and organizational performance. However, research explaining how principals translate ecological visions into everyday learning practices in kindergartens remains limited, particularly in schools located in rural communities. Agricultural environments, natural materials, community activities, and local knowledge have considerable potential as authentic learning resources for

children. Realizing this potential requires leadership capable of integrating these resources into the school vision, learning programs, teacher innovation, and consistent habituation.

Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten utilizes the surrounding environment, agricultural activities, natural materials, and community life as part of children's learning experiences. These characteristics make the school a relevant setting for examining how the principal directs the use of local potential for environment-based learning. The novelty of this study lies in its analysis of Green Transformational Leadership practices at the kindergarten level, particularly in explaining how an ecological vision is enacted through support for learning. This study aims to analyze the principal's Green Transformational Leadership practices in supporting environment-based learning at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten. The findings are expected to extend scholarship on green educational leadership in early childhood education and provide practical implications for developing contextual and sustainable environment-based learning.

METHOD

This study employed a qualitative approach with a case study design. This design was selected because the study focused on developing an in-depth understanding of the principal's Green Transformational Leadership practices in supporting environment-based learning at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten. In this study, environment-based learning refers to learning activities that integrate environmental values through direct experiences, the utilization of the surrounding environment, the use of natural and waste materials as learning media, and the habituation of environmentally responsible behavior at school.

The research informants consisted of the principal (KS) and two teachers (GK 1 and GK 2), who were purposively selected based on their direct and ongoing involvement in the planning, management, and implementation of environmentally-based learning. The principal was chosen because of his authority in determining policy direction and coordinating school programs, while the two teachers were chosen because of their involvement in developing tools, implementing learning, and fostering environmentally conscious behavior. These three informants were key actors with the knowledge and experience most relevant to the focus of the case study. Students were not interviewed as informants, but rather as subjects of observation within the context of learning implementation and fostering environmentally conscious behavior.

Data were collected through semi-structured interviews, observations, and documentation studies. Interviews were used to explore the principal's leadership practices, teacher support, and the implementation of environmentally-based learning. Observations were conducted of learning activities, the use of natural materials and waste, and environmental care routines that took place during the data collection period. Activities that could not be directly observed, such as some out-of-class learning, were confirmed through information from informants and documentation of school activities. The documentation study included the school's vision and mission, curriculum, RPPM (Regional Development Plan), RPPH (Regional Development Plan), student work portfolios, and activity photos. The use of various data sources was intended to expand empirical evidence and reduce the research's reliance on a limited number of informants.

Data analysis was conducted interactively through three stages: data condensation, data presentation, and conclusion drawing. In the condensation stage, researchers selected, focused, and grouped data from interviews, observations, and documentation based on the themes of Green Transformational Leadership practices and environmentally based learning. The data was then presented in the form of descriptions and thematic mapping to identify patterns and interrelationships. The final stage involved repeatedly drawing and verifying conclusions by checking the consistency of evidence from various sources and data collection techniques.

Data validity was strengthened through source and technique triangulation. Source triangulation was conducted by comparing statements from the principal and teachers, while technique triangulation was conducted by matching interview results with observations, learning materials, student work portfolios, and activity documentation. Triangulation was applied proportionally according to the availability of evidence for each theme, so not all findings had to be supported by all three techniques simultaneously. Findings that were not directly observed are presented as informant-reported practices and confirmed through other available data sources.

RESULTS AND DISCUSSION

Leadership Direction Based on an Environmental Vision

The principal's Green Transformational Leadership practices at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten are evident in the school's vision and mission, which are translated into directions for instructional policy. The school's vision is "The realization of children who are physically and spiritually healthy, intelligent, creative, noble in character, and socially minded." This vision is further elaborated in one of the school's missions: "to develop intelligent and critical-thinking children by using the surrounding environment as a learning resource." This formulation indicates that the surrounding environment is positioned as part of the school's institutional orientation rather than merely as an additional learning activity.

This policy direction is operationalized through a learning-planning process routinely conducted by the principal and teachers. The research data show that the principal and teachers hold weekly meetings to prepare and reflect on the weekly and daily lesson plans (RPPM and RPPH). During these meetings, learning themes are selected not only on the basis of curriculum requirements but also in accordance with the conditions of the school's surrounding environment, including agricultural activities, harvest seasons, natural materials, and local community life. The school's vision of utilizing the surrounding environment therefore does not remain a formal statement but is translated into lesson plans, theme selection, learning media, and forms of children's activities.

This process differs from conventional learning administration because the development of RPPM and RPPH is not solely focused on meeting document requirements, schedules, and curriculum requirements. Weekly meetings are used to consider local ecological conditions in determining objectives, themes, media, activities, and learning spaces. Agricultural seasons, natural resources, used materials, and the lives of the surrounding community are treated as part of the pedagogical decision-making process. Thus, lesson planning serves as a means of translating environmental vision into contextual learning experiences.

This leadership approach demonstrates that the principal acts as a driver of policy direction rather than as the sole owner of the school vision. The principal facilitates teachers in translating the institutional vision into everyday learning practices. For example, outdoor learning is routinely scheduled, surrounding settings such as rice fields and livestock farms are used as learning spaces, and natural and waste materials are employed as learning media (Interview with GK 1, 2025). These practices demonstrate a connection among the school vision, teachers' planning, and the implementation of environment-based learning both inside and outside the classroom.

Within the Green Transformational Leadership framework, this process reflects the inspirational motivation dimension, as the principal provides direction, meaning, and shared purpose to teachers in developing environmentally-based learning. The transformational element is evident in the principal's ability to inspire, engage, and mobilize teachers to translate the school's vision into learning practices. Meanwhile, the green element is evident in the orientation for change, specifically directed at utilizing the local environment, using resources

responsibly, reusing used materials, and providing children with direct experiences interacting with nature. Thus, the changes created are not only related to increasing teacher creativity and collaboration but also to strengthening ecological values and practices in learning.

These findings align with the view that green leadership can shape a pedagogical direction oriented toward the environment and sustainability (Male & Palaiologou, 2015; Wirawan et al., 2024). Similarly, transformational leadership, through a clear vision, can create a positive learning environment by providing inspiration and direction for the school community (Lamirin et al., 2023). In this study, this orientation is reflected in the consistent use of the environment as a learning resource and a means of building children's ecological experiences.

The principal's leadership direction at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten is evident in her ability to translate this orientation into learning practices. The principal facilitates the planning process, directs the utilization of the surrounding environment, and ensures that environment-based learning becomes part of the school culture. Thus, Green Transformational Leadership goes beyond the formulation of a vision but is manifested through learning policies, teaching materials, media selection, and the learning experiences of the children.

The Principal's Role Modeling in Environmentally Responsible Practices

Based on the interviews, the principal is directly involved in managing used materials generated by school activities, which are subsequently repurposed as learning media. Teachers reported that the principal frequently demonstrates environmental responsibility through simple actions, such as picking up litter, disposing of it properly, and collecting plastic bottles for use as learning media. One teacher explained, "I also learn from the principal. When we conduct activities around the school environment, she usually demonstrates her concern for the environment by picking up scattered litter and putting it in the bin, or, in the case of plastic bottles, collecting them to be used as learning media" (Interview with GK 2, 2025).

These data indicate that the principal's role modeling constitutes a form of leadership practice that supports environmentally responsible habits at school. The principal does not merely give instructions to teachers and students but demonstrates concrete actions that can be observed and imitated. Picking up litter, collecting plastic bottles, and repurposing used materials as learning media show that environmental values are enacted through everyday practices.

Within the framework of Green Transformational Leadership, these actions reflect the dimension of idealized influence. The principal serves as a role model who demonstrates consistency between expressed values and actual conduct. Such role modeling is particularly important at the kindergarten level because environmental values are more readily introduced through concrete examples than through abstract verbal explanations. Children can observe the behavior of adults around them, while teachers gain examples of practices that can be continued through learning activities and habituation.

This finding is consistent with the concept of transformational leadership, which positions leaders as role models for organizational members (Judge & Piccolo, 2004; Munif et al., 2023). The principal's consistent behavior can serve as a source of values for teachers and students. When the principal demonstrates concern for cleanliness and the reuse of discarded materials, such behavior indicates the transmission of ecological values through role modeling. This is also consistent with the view that leaders' pro-environmental behavior can encourage organizational members to adopt similar values by reinforcing shared commitments (Ren et al., 2024).

Thus, the principal's exemplary behavior serves as a mechanism for transmitting ecological values throughout school life. Leadership influence occurs not only through formal

direction but also through daily behaviors observed, imitated, and passed on by teachers in their learning and instilling in children.

The Principal's Support for Teacher Creativity

In addition to providing policy direction and role modeling, the principal's Green Transformational Leadership is evident in the support provided for teacher creativity. This support is particularly apparent in the way the principal gives teachers opportunities to develop ideas for environment-based learning in accordance with the school's conditions. Based on interviews and documentation, the principal and teachers hold weekly meetings to prepare and reflect on the weekly and daily lesson plans (RPPM and RPPH). These forums provide space for discussing activities, adapting learning media, and identifying solutions to limitations in instructional facilities.

Teachers reported that the principal provides space for instructional ideas and initiatives. One teacher stated, "Whenever I have an idea, the principal always listens to it, discusses it, and follows it up" (Interview with GK 1, 2025). This statement indicates that teachers do not merely receive instructions but are involved in developing learning activities. The principal allows teachers to propose ideas, discuss their feasibility, and adapt them to the materials available in the school's surrounding environment.

The principal's support was also evident when teachers faced budget constraints and the limited availability of commercial learning media. The principal responded to these conditions by opening up discussion spaces in weekly meetings, listening to teachers' ideas, providing input, and encouraging the use of local resources and recycled materials as alternative learning media. This strategy resulted in various learning innovations, such as using leaves for writing and stamping activities, corn kernels to form letters, and plastic bottles, bottle caps, gallon jugs, and leftover printing paper to create media and children's artwork. These findings indicate that limited resources do not hinder the learning process but instead encourage creative, contextual, and environmentally friendly activities. Thus, teacher creativity does not develop solely individually, but grows through the principal's support, reflection forums, and collective courage to develop alternative learning methods from available resources.

Within the Green Transformational Leadership framework, these practices reflect intellectual stimulation and individualized consideration. Intellectual stimulation is evident when the principal encourages teachers to think creatively about using the environment and discarded materials as learning media. Individualized consideration is apparent when the principal attends to teachers' ideas, needs, and challenges in implementing learning activities. This finding is consistent with the view that, under transformational leadership, principals act as facilitators who provide teachers with opportunities to express ideas and develop instructional innovations (Baharuddin et al., 2024). Appreciation of teachers' ideas also reflects attention to individuals' intellectual capacities within the school organization (Khan et al., 2025). In the context of environment-based learning, support from the principal can strengthen teachers' motivation and efficacy in implementing creative and contextual pedagogical practices (Widyastuti et al., 2024).

Support for teacher creativity should be directed toward strengthening reflection and ensuring the continuity of learning practices. Ideas generated during weekly meetings should not function merely as immediate responses to activity requirements but should be developed into learning experiences that can be progressively refined. Teachers need to reflect on the use of natural materials, discarded objects, and the surrounding environment so that learning is not only creative in terms of media but also ecologically meaningful. This is important to ensure that environment-based learning does not depend solely on spontaneous initiatives but becomes a purposeful, contextual, and sustainable pedagogical practice.

Utilizing the Surrounding Environment as a Learning Resource

Environment-based learning at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten is evident in the utilization of the surrounding environment as a learning resource. Documentation and interview findings indicate that the principal encourages teachers to develop learning activities closely connected to children's lives. Learning themes are designed by considering local environmental conditions, such as agriculture, harvest seasons, natural materials, and local community activities. The environment is not merely the setting for activities but forms part of children's learning experiences.

One form of environment-based learning is outdoor learning. The principal explained that the school routinely schedules learning activities outside the classroom. She stated, "We routinely schedule outdoor learning, at least once a week on Friday or Saturday, so that the children can observe and learn directly from nature and the surrounding environment. Sometimes we visit rice fields, and at other times we visit cattle farms owned by local residents. Of course, we coordinate with the owners beforehand" (Interview with KS, 2025). This statement indicates that outdoor learning is deliberately planned by utilizing the community environment as a learning space.

Outdoor learning provides children with opportunities to encounter nature and community life directly. Rather than merely receiving explanations from teachers, children can observe rice fields, livestock farms, plants, animals, and the activities of local residents. In kindergarten contexts, such direct experiences are important because children are at a developmental stage that requires concrete learning. The surrounding environment functions as a medium through which children can understand relationships among human beings, nature, and everyday life.

In addition to outdoor learning, environment-based learning is evident in the use of natural and waste materials as learning media. Materials such as used bottles, bottle caps, leftover printed paper, and natural objects found around the school are utilized in literacy, numeracy, arts, and sensory exploration activities (Observation, 2025). The use of these media demonstrates that learning does not depend entirely on commercial products but can be developed through readily available local resources. In this context, natural and waste materials function not only as learning aids but also as means of introducing the values of reuse and environmental responsibility. Documentation of these two activities is presented in Figure 1.



Figure 1 shows that the environment and used materials are not only used as supplementary activities, but are integrated as sources of concrete, contextual, and ecologically oriented learning experiences.

These findings indicate that environment-based learning at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten is contextual because it is rooted in the local environment. Ecological education is not presented as an abstract concept but through experiences closely connected to children's lives. This is consistent with the understanding of ecopedagogy as an approach that fosters awareness, understanding, and life skills aligned with environmental preservation (Yunansah & Herlambang, 2017). In this school context, environment-based learning can be understood as a practical form of ecopedagogy because it is integrated into children's learning routines through the surrounding environment, natural materials, waste materials, and direct experiences (Rahma et al., 2024; Virskya A. F. et al., 2025).

Utilizing the surrounding environment also helps children connect their experiences at school with their lives at home. Because most students' parents work as farmers, agricultural themes and nature-related activities are closely connected to children's social experiences. This enables learning to become more meaningful because children recognize objects, activities, and situations encountered in their daily lives. Thus, environment-based learning not only introduces the environment as an object of study but also develops connections among the school, family, community, and nature. Such learning has the potential to strengthen how children understand and relate to the environment from an early age (Bernardes, 2020).

At the operational level, the use of loose parts derived from natural and waste materials also indicates a transition toward more sustainable learning. The use of local materials can reduce dependence on commercial learning media and enable children to experience how surrounding objects can be creatively reused. This practice is consistent with the proposition that natural and waste materials can serve as learning media that support sustainable education (Fadilla Lestari, 2025). The use of concrete objects also helps children understand learning concepts more tangibly because they interact directly with objects that can be touched, observed, and manipulated (Romadhon et al., 2024).

Regular outdoor learning also strengthens the experiential learning dimension of environment-based learning. Visits to rice fields, livestock farms, or surrounding community settings provide important sensory and emotional experiences for children. Through these activities, children can develop a sense of closeness to nature, learn about living organisms, and understand the environment as part of their lives. Emotional connectedness with nature is an important foundation for cultivating environmental concern from an early age (M. Yesin & Ma'aruf, 2024; Rahayu, 2025).

The use of the surrounding environment needs to be critically examined so that it doesn't stop at just visits or the use of natural materials. Interviews show that after activities in rice fields, farms, or the surrounding environment, teachers reinforce values through simple conversations tailored to the children's developmental level. Teachers encourage children to discuss the importance of caring for the environment, caring for living things, and educate them about the negative impacts of environmental damage. These reflections are not conducted in formal sessions, but are integrated through reflective dialogue and verbal reinforcement after the activities. This practice demonstrates that environment-based learning not only produces concrete experiences but also helps children develop a basic understanding of the relationship between humans and nature and the responsibility to care for it.

Accordingly, environment-based learning at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten is implemented by utilizing the surrounding environment, conducting outdoor learning, using natural and waste materials, and aligning learning themes with the life of the

local community. These practices show that the principal's support for environment-based learning is manifested not only in policy direction but also in organizing concrete and relevant learning experiences for young children. Nevertheless, the quality of learning should be continuously strengthened through reflection, reinforcement of ecological meaning, and continuity between children's experiences at school and their lives at home.

Habituation of Environmentally Responsible Behavior at School

The principal's support for environment-based learning is also evident in the habituation of environmentally responsible behavior at school. Interviews and observations indicate that the school familiarizes its community members with reusing discarded materials, conserving water and electricity, bringing reusable drinking bottles, caring for plants, and carrying out simple sorting of organic and inorganic waste. These habits are incorporated into daily activities and integrated with learning, so children are not only instructed to dispose of waste properly but also begin to recognize different types of waste through direct practice in the school environment.

The principal emphasized that environmentally responsible behavior is cultivated through simple and consistent activities. She stated, "We accustom all members of the school community to being more mindful of electricity use, water use, and waste management because children learn to take responsibility for the environment through these small habits" (Interview with KS, 2025). This statement indicates that the principal regards habituation as an important component of environmental education in kindergarten. Young children are introduced to environmental responsibility through simple actions repeatedly practiced in school life.

A teacher also explained that the school encourages the more efficient use of resources and the reuse of discarded materials. She stated, "We always pay attention to the use of lights, and we turn them off when they are no longer needed. We leave the Wi-Fi on in case local residents also need it. For drinking water, we provide washable cups. The empty water containers are then collected and used for creative projects, and some have also been turned into plant pots" (Interview with GK 2, 2025). These data indicate that the habituation of environmental responsibility occurs not only through formal learning activities but also through the everyday routines of teachers and the school.

Students are also involved in activities that support the habituation of environmentally responsible behavior. Children are accustomed to disposing of waste properly, participating in waste-sorting activities, bringing reusable drinking bottles and packed meals, tidying up play equipment, and taking part in planting and plant-care activities. A teacher explained, "We have planting activities here, usually in the area behind the school. We provide polybags, soil, fertilizer, and seeds or seedlings. The children then plant together, and on subsequent days they participate in care activities, such as watering the plants" (Interview with GK 1, 2025).

In the context of this study, these behaviors are more appropriately understood as the initial habituation of environmentally responsible behavior rather than as evidence of long-term changes in sustainable behavior. This distinction is important because the study was not designed to measure changes in students' behavior quantitatively or longitudinally. Nevertheless, observation and interview data indicate that the school has established routines that enable children to experience and practice environmental values directly.

This habituation is related to the function of the hidden curriculum in early childhood education. Teachers and the principal do not teach environmental responsibility solely through instructions but also demonstrate it through everyday conduct. Routines such as turning off lights, reusing water containers, sorting waste, and caring for plants become part of a school culture that children can observe. In this respect, the behavior of teachers and the principal serves as an example that reinforces ecological learning. This finding is consistent with the view that teachers' professional behavior can be reflected in environmentally friendly practices

incorporated into their daily work routines (Hidayati et al., 2024). Habituation embedded in school routines can also function as a hidden curriculum with the potential to support the development of students' environmentally responsible behavior (Gusmawanti et al., 2022).

The habituation of environmentally responsible behavior should, however, be interpreted cautiously. The research data demonstrate the existence of habituation practices but are insufficient to establish profound and long-term changes in students' behavior. To strengthen this habituation, the school should maintain the repetition of practices, provide consistent examples, and establish simple communication with parents regarding environmentally responsible habits at home. Parental involvement is important because children's ecological habits are formed not only at school but also through repetition within the family environment.

These habituation practices also indicate the participation of the school community in maintaining the continuity of environment-based learning activities. Although the school faces limitations in facilities and funding, the principal and teachers seek to utilize available resources. Discarded materials are transformed into learning media, the surrounding environment is used as a learning space, and simple activities become opportunities to cultivate ecological habits. This pattern suggests that leadership that integrates environmental goals into school culture can encourage members of the school community to participate in green practices (Wardatussa'idah et al., 2024).

Overall, the findings indicate that the principal's Green Transformational Leadership practices support environment-based learning through four interrelated patterns. First, the institutional vision is translated into a learning direction that positions the environment as a learning resource. Second, the principal provides role modeling in environmentally responsible practices. Third, teacher creativity is encouraged through the development of learning activities that utilize the surrounding environment, natural materials, waste materials, and outdoor activities. Fourth, the principal supports teachers' ideas, facilitates reflection on learning, and helps identify solutions to constraints and limited facilities. These findings demonstrate that the success of environment-based learning is determined not only by activity planning but also by the principal's ability to establish alignment among vision, role modeling, teacher innovation, reflective support, and school culture. This alignment subsequently strengthens the habituation of environmentally responsible behavior in school routines. The sustainability of these practices continues to require consistent habituation, the collective involvement of the school community, and parental support.

Based on the explanation above, Green Transformational Leadership practices were identified through four leadership dimensions manifested in five research themes. The relationships between the themes, GTL dimensions, sources of evidence, and interpretation of the findings are summarized in Table 1.

Table 1. Synthesis of Principals' Green Transformational Leadership Practices

Theme	Relationship to GTL	Interview	Observation	Documents	Interpretation
Vision-based environmental leadership	<i>Inspirational motivation</i>	Weekly meetings integrate environmental aspects into the weekly and daily lesson plans, RPPM and RPPH	Environmental resources are utilized in learning activities	School vision and mission statements, RPPM, and RPPH	The environmental vision is translated into a clear direction for learning
Environmental role modelling	<i>Idealized influence</i>	The principal sets an example by managing waste and	Ecological practices are evident in daily school routines	Documentation of learning media made from reused materials	The principal's role modelling transmits environmental values

		reusing discarded materials			
Support for teachers' creativity	<i>Intellectual stimulation and individualized consideration</i>	Teachers' ideas and challenges are discussed and followed up	Natural materials and waste materials are used as learning media	RPPM, RPPH, learning media, and children's work	The principal's support encourages environmentally friendly innovation
Utilization of the environment as a learning resource	Manifestation of GTL in learning	Outdoor learning activities utilize the surrounding community environment	Natural materials are used in various learning activities	Documentation of outdoor learning activities	The environment serves as a source of concrete learning experiences
Habituation of environmentally responsible behaviour	Manifestation of GTL in school culture	Habituation practices include resource conservation, waste management, and plant care	Environmentally responsible practices are evident in daily school routines	Documentation of environmental care activities	Environmental values are fostered through everyday school culture

The five findings above demonstrate that the four dimensions of Green Transformational Leadership work in an integrated manner to support environmentally-based learning. Visionary direction, role modeling, creativity stimulation, and attention to teacher needs are manifested in the utilization of the environment as a learning resource and the instilling of environmentally conscious behaviors. These findings confirm that principal leadership not only directs learning practices but also integrates environmental values and practices into school life.

CONCLUSION

This study concludes that the principal's Green Transformational Leadership practices support environment-based learning at Pertiwi Eka Tunas Bhakti Wanacipta Kindergarten through four main dimensions. First, inspirational motivation is manifested in the principal's ability to translate the institutional vision into a learning direction that utilizes the surrounding environment as a learning resource. Second, idealized influence is evident in role modeling related to maintaining cleanliness, reusing discarded materials, and demonstrating environmentally responsible behavior to teachers and students. Third, intellectual stimulation is reflected in the encouragement provided to teachers to develop creative learning activities using natural materials, waste materials, rice fields, livestock farms, and local community activities. Fourth, individualized consideration is demonstrated through support for teachers' ideas, the facilitation of weekly reflection, and efforts to identify solutions to constraints and limitations in learning facilities.

The findings indicate that environment-based learning in kindergarten is determined not only by teacher creativity but also by the principal's leadership in providing direction, role modeling, stimulation for innovation, and reflective support. The implications of this study emphasize the importance of strengthening a collaborative school culture, systematically utilizing the potential of the local environment, and maintaining continuity in the habituation of environmentally responsible behavior between school and family. Future research may compare Green Transformational Leadership practices across several kindergartens in different geographical contexts or examine parental involvement in strengthening children's ecological habits at home.

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