

Social Sciences Spectrum

A Double-Blind, Peer-Reviewed, HEC recognized [Y-category](#) Research Journal

E-ISSN: [3006-0427](#) P-ISSN: [3006-0419](#)

Volume 05, Issue 01, 2026

Web link: <https://sss.org.pk/index.php/sss>



Ecological Literacy Enhancing Children's Well-being in Early Childhood Education

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Article Information [YY-MM-DD]

Received 2025-12-21

Revised 2026-01-20

Accepted 2026-02-08

Citation (APA):

Rashid, H & Naseem, A (2026). Ecological literacy enhancing children's well-being in early childhood education. *Social Sciences Spectrum*, 5(1), 193-206. <https://doi.org/10.71085/sss.05.01.476>

Abstract

Ecological literacy encourages incorporating ecological practices in ECE settings to support children's sustainable well-being from ages 3-6. The qualitative research approach with phenomenological design was used for the study. Three private schools with six early childhood teachers voluntarily participated in the study. All three schools were located in Islamabad. Six teachers with 3 to 5 years of experience were contacted for structured and semi-structured interviews. Each interview continued for 40 to 45 minutes. The interviews were recorded with participants' permission. To interpret the lived experiences, the transcription was coded, aligned with themes, and analyzed. Initial transcriptions were shared with interviewees for confirmation and affirmation of the themes. The findings of this phenomenological study indicate that participating private schools in Islamabad are incorporating ecological literacy-based practices in early childhood academic settings, and that participants have observed progressive changes and improvements in children aged 3-6 in a naturalistic environment. Children exhibit relaxed behavioural, physical, social, and psychological patterns while interacting with the ecological environment. The study also suggests that ecological practices encourage children to participate in nature-based activities, thereby promoting their social, emotional, behavioural, and psychological well-being.

Keywords: Early Childhood Education, Aged 3-6, Ecological Literacy, Ecological Practices, Sustainable Well-being, Phenomenology, Voices.



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Introduction

It is believed that nature is the most effective educational tool and helps develop a strong, naturally formed relationship between children and the environment at an early age (Friman et al., 2024). Play fosters strong links between children and nature; therefore, curriculum practices need to be aligned with the inherent patterns of the natural world to strengthen this relationship (Park & Kim, 2024). The natural environment offers opportunities to directly touch water, plants, soil, rocks, and a variety of textures (Yusuf et al., 2023), which are keystones of ecological literacy. By designing learning experiences that tap into natural interactions among children, it is possible to be developmentally sensitive to ecological systems (Zaatari & Maalouf, 2022).

Current international issues require a deeper understanding of ecological changes and their effects on children's well-being, which are dynamic and evolving (Ardoin et al., 2023). The environmental change with unparalleled impacts requires children to be critically informed and prepared to adapt to ecological changes (Ali, 2025). Only environmentally friendly practices that promote healthy interaction with nature, environmental safety, and an evolutionary ecological system can create sustainable child well-being in the current context (Duan, 2025).

Early childhood education in Pakistan varies by context, setting, curriculum, and pedagogy (Jabeen et al., 2024). The lack of a standardized ECE curriculum leads to diverse applications of instructional strategies, all of which reflect local resources. However, the call for ecological literacy has been strengthened by the severity of climate change in the area. As future citizens, children need to understand natural processes, how ecosystems work, and the skills to be stewards of the environment, which will benefit them and the environment (Jabeen et al., 2024).

The proposed research aims to investigate the lived experiences of teachers in early childhood settings and to examine how ecological literacy practices are incorporated into academic practice. The initial findings indicate that ecological involvement will improve children's well-being and foster lifelong, sustainable behaviors in children aged three to six years (Saputri & Waluyo, 2024).

Rationale of the Study

The research was undertaken to understand early childhood teachers' lived experiences of integrating curricular practices rooted in ecological literacy, a facet of children's naturalistic intelligence, for children aged 3 to 6, with the objective of enhancing their capacity to attain sustainable well-being across their lifespans. It is essential to develop children's naturalistic intelligence early, and teachers fulfill a crucial role in embedding ecological literacy practices.

Research Objective

The objective of the study was to:

1. Understand how sustainable well-being can be promoted through children's ecological literacy.

The study aimed to answer the following question:

Research Question

1. How do ecological practices in ECE with children aged 3 to 6 enhancing well-being of children in participating schools in Islamabad?

Significance of the Study

This research emphasizes children's interactions with peers, especially ages 3-6, and their involvement in ecological practices, thereby enhancing their ecological literacy and connection

with the environment. Nature provides children with limitless opportunities to interact with different forms and textures of natural materials, which enhances their social, emotional, and physical health in diverse ways. The study also aims to provide a substantive discussion of incorporating ecological practices to improve and sustain children's well-being by capturing the voices of early childhood teachers working in private-sector ECE academic settings in Islamabad.

Literature Review

Ecological Literacy during Early Childhood

Ecological practices in education refer to teaching and learning practices and institutional conditions that build relationships among children, the environment, community, and sustainable ways of life (Qamruzzaman, 2025). In early childhood education (ECE), the integration of ecological practices affects the cognitive, affective, and behavioral development of young learners. In children aged 3 to 6 years, the stage is vital for coordinating emotional, social, physical, and cognitive development (Vuong & Nguyen, 2025). Empirical evidence shows that implementing ecological practices in ECE programs improves overall health by developing emotional resilience, cognitive abilities, social behavior, and physical well-being (Loo, 2025).

The theory of ecological systems underpins ecological education, which holds that children develop as products of interpersonal and ecological interactions (Stavreva et al., 2025). Children thrive in caring, participatory environments that include the natural environment and foster positive self-identity and resilience in early childhood (Inaba, 2025).

The Ecological Literacy Necessity of ECE

Outdoor play and exploration are among the most important learning experiences for children ages 3 to 6. Evidence-based research shows that active use of nature is associated with increased curiosity, improved problem-solving skills, and better emotion regulation. Such consequences are directly linked to overall well-being, as children are more confident, calm, and capable when they have the opportunity to explore and learn through sensory experiences (Vuong & Nguyen, 2025).

Ecological education creates a feeling of responsibility and environmental awareness (Desmarais, 2023). Early exposure to natural environments fosters a sense of environmental care and sustainable practices (Alan, 2025). This awareness has been associated with well-being, as children who feel connected to nature often report a greater sense of purpose and community (Norling, 2025).

Physical and Psychological Health of Children

Ecological benefits are well-documented physical benefits. Natural outdoor play increases physical activity, thereby improving motor skills, balance, strength, and coordination (Coddling, 2025). For preschool-aged children who struggle to develop basic physical skills, frequent exposure to a variety of outdoor activities is not possible in an indoor environment. Schoolyard greening and the establishment of garden areas will allow children to run, climb, and explore, which is important in supporting healthy development and countering sedentary habits (Bilton, 2025).

Emotional and Psychological Well-Being of Children

Ecological practices are also beneficial for emotional and psychological well-being. Nature has therapeutic effects that alleviate stress and anxiety in young children. Natural environments provide soothing, regular, and balanced sounds and diverse sensory data that allow self-regulation

of emotional responses. Bhaiswar et al. (2025) highlighted that children who are engaged in ecological learning say that they feel happy, amazed, and a sense of belongingness- aspects important in emotional development. Ecological practices in ECE settings in Islamabad have the potential to offer an alternative learning environment (to academic pressures) and facilitate balancing the structured activities and free, playful interactions, which will help the children in their emotional and overall well-being (Ghias, 2025).

Social Development and Ecological Practices

Another dimension of interest regarding ecological practices is social development. Natural play environments foster cooperative play, joint problem solving, and communication (Blatchford, 2025). Children learn to negotiate, share information, and respect others' opinions through group work (planting gardens, observing insects, building natural structures (Rozana et al., 2025)). These relationships play a central role in early childhood, laying the foundation for empathy, teamwork, and social competence. The environmental activities used in ECE with children aged 3-6 promote well-being, including physical exercise, emotional regulation, interpersonal communication, and connection with the environment (Yang et al., 2025). Studies have shown that these practices contribute to developmental outcomes that support children's overall well-being.

Ecological Practices in early childhoods in Islamabad

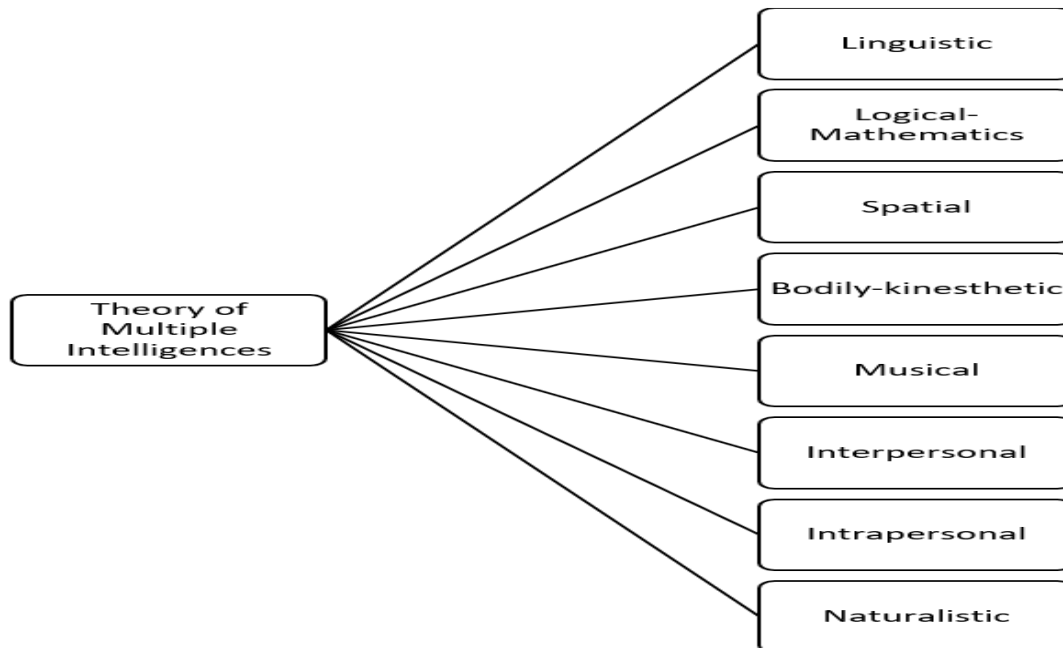
Schools in Islamabad, which are characterized by diverse cultural and socio-economic backgrounds, use ecological practices to create inclusive environments that foster respect for one another and socialization. The inclusion of ecological principles in the ECE programs also motivates children to value the environment in which they live and to engage in environmental management (Vodopivec & Sindic, 2025).

An ecological strategy in the private-sector academic and early childhood context of Islamabad will provide even better, more valuable learning experiences that foster healthy development and a sustainable attitude. Yet most schools have small playgrounds and lack the resources to integrate ecological practices into their design. These limitations significantly affect children's physical health by limiting opportunities for active movement and risk-controlled play (Ghias, 2025). The rapid growth of cities also restricts natural play areas and makes ecological practices in schools particularly important for promoting children's overall well-being.

Theoretical Framework

According to Howard Gardner's theory of Multiple Intelligences, as shown in Figure 1, there are many domains of intelligence, including a naturalistic domain (Gardner, 2020). This research highlights the critical relationship between ecological literacy and ecological practices, and the naturalistic field of intelligence, thereby enabling learners to develop a significant relationship with nature (Gardner & Hatch, 1989).

Fig. 1: *Theoretical Framework of the Study: Howard Gardner and Hatch (1989)*



This theoretical foundation offers opportunities to bridge the gap between ecological literacy and ecological practices, as well as between naturalistic assumptions about intelligence, thereby facilitating meaningful interaction with nature (Gardner & Hatch, 1989).

Research Methodology

In this study, a qualitative approach was used to analyze participants' lived experiences, employing a phenomenological research design supplemented by hermeneutic analysis, which provides an in-depth understanding of participants' voices (Dodgson, 2023). The perceptions of the early-childhood teachers were collected in order to investigate the role of ecological literacy in the sustainable well-being of children aged between three and six years in privately run early-childhood institutions within Islamabad.

A total of six early-childhood teachers from three Islamabad-based private schools in Pakistan constituted the sample. The participants were selected purposively based on their professional experience and willingness. They described their understanding of how to incorporate ecological literacy into pedagogical practices through semi-structured, topic-based interviews, with the aim of enhancing the long-term, sustainable well-being of children aged three to six years.

A series of structured and semi-structured interview questions was designed before the data collection. These probes produced demographic data on teachers, described ecological practices used in and out of the classroom, and analyzed how ecological literacy was incorporated into instructional plans. One of the main subsections was based on the physical, behavioural, and socio-emotional effects of ecological literacy on young children. The supervisory committee peer-reviewed the instrument in order to improve consistency and precision in participants' responses.

Data Collection

Three private schools were purposively chosen for data collection, serving as private schools in Islamabad that offer early-childhood programs. The administrative authorities were formally

The word cloud shows how themes originated and related, and the sub-themes were chosen from the transcript for in-depth interpretation and understanding of participants' lived experiences of ecological literacy and its need in ECE.

Table 1: *Interpretive Thematic Index*

Major Themes	Sub-Themes
Holistic Well-Being	Emotional Balance Curiosity
Ecological Practices	Supporting Physical Vitality Active outdoor play
Connectedness and belonging	Cooperative ecological activities Socio-emotional connectedness

Results and Interpretation

The following section interprets the voices of teachers working in ECE academic settings in the Private sector of Islamabad using the thematic index presented in Table 1 and addresses the research objective and research question, which aimed to understand the connection between ecological literacy practices and their effects on children aged 3 to 6. The established research question sought to understand the contribution of ecological practices to children's well-being between the ages of 3 to 6.

The interpretation of the teachers' voices answers the established research question of how ecological literacy enhances children's well-being, and the themes and sub-themes explain this in detail, including children's behavioral, emotional, psychological, and social balance through ecological literacy practices.

This analysis decodes the views of teachers working in privately financed early childhood settings in Islamabad, using the thematic index provided in Table 1. The section addresses the main research objective and question by examining the relationship between ecological literacy practices and their impact on children aged three to six. The findings explain the role of ecological literacy in enhancing children's well-being, and the themes and sub-themes provide a multi-level perspective on the behavioural, emotional, psychological, and social balance promoted by ecological pedagogy.

Theme 1: Holistic Well-Being

Children have a special attachment to interaction with nature. Nature, in its entirety, influences children's personalities and their existence. There are no way artificial elements can produce such a sense of connection to soil, water, and other natural elements.

Participants W shared;

“Soil, leaves, and water are something that children touch on every day in our setting. I observe them learning in their senses, which indoor materials never permit”.

One more participant, C had a good voice, and this was because of the following;

“We include natural corners and activities in the garden so that children can smell flowers, listen to birds, and touch the texture. These sensory aspects can make them remain active and focused”.

Ecological interaction enables children, especially those aged 3 to 6, to engage with natural elements, which can improve their senses. Children have good sensory experiences through touch, smell, and texture. Indoor objects are undoubtedly productive and useful, but there are additional ways to interact with nature: we can see, smell, and touch items that might otherwise appear normal or unimpressive. Nevertheless, contact with natural objects contributes to children's real sensory experiences. This is geared towards sustainable children's well-being. Exposure to nature and to any form of unpleasant experience can benefit children throughout their lives.

Emotional Balance

Participant A, Y, and H said;

“The green area has become the domain where children have a natural tendency to slow down. Even the ones that cannot find peace in their homes are at peace indoors”.

Early childhood learners can enhance their behavior and psychological health by connecting with nature. Children aged 3 to 6 are more nervous and require greater autonomy when venturing into their surroundings.

“Having nature time has minimized restlessness in our environment. Even the environment itself favors placid conduct”.

“When children are overwhelmed, we tend to spend time learning in the garden. In nature, they can control their emotions”.

The closer they get to their natural environment and explore it, the less tense and psychologically imbalanced they are. They are more satisfied and joyful, and it appears that simple things matter more to them; they can rest by playing with leaves and earth, embracing trees, hearing birds, and sitting on the green grass. I just hope no one will be able to remain collected in such a peaceful location, even adults. Such habits will help them stay connected to nature throughout their lives.

Curiosity

Curiosity is one of the most intellectually challenging tasks a child engages in when interacting with the natural world, including flora, fauna, abiotic factors such as the sun, and a host of organisms found in the ecological environment.

Participants I and F shared;

“Through ecological activities, children will begin to ask their own questions about insects, plants, and weather. They are more authentic in their interest and self-motivated”.

“The outdoor ecology work has transformed ordinary experiences into enquiry moments. Natural inquisitiveness is now nurtured in the environment”.

The participant also noted that children are more curious when they witness phenomena firsthand and are more likely to draw conclusions about them. These investigative tendencies cannot develop in indoor settings and, therefore, are restricted to natural settings. Ecology activities and practices encourage inquiry-driven learning and enable the children to question natural processes. These rich experiences not only fulfil psychological needs but also alter behaviour patterns and enhance curiosity. Children at the early childhood level of education can process information more freely by taking ownership of their learning and asking questions.

Theme 2: Ecological Practices

Ecological practices among children aged three to six are the main strategies that support their learning through the use of natural materials close to the child. All ecological components are intertwined with the human experience, which can only be studied in depth when interaction with nature is encouraged from an extremely young age; this helps foster long-term relationships that ensure well-being not only throughout youth but also into adulthood.

The Enhancement of Physical Vitality

Ecological activities foster physical well-being in young children, particularly those in early childhood settings aged three to six years. This developmental period requires practical experience and connection with the environment to foster a habit of exploration.

Participant F and W shared;

“Physical development is facilitated by activities such as digging, planting and hauling of natural materials. They are strengthening themselves in the process of learning”.

“Our ecological activities consist of daily outdoor activities and physical labour. This has enhanced the energy level and body confidence of children”.

By interacting with natural features, plant saplings, and their growth, children engage in physical and visual activities. These observations reflect the real-life experiences of early childhood teachers in ecological practices, which serve as the basis for nurturing a child's physical vitality and embodied skill sets.

The fact that the author speaks of daily outdoor activities and practical work shows that active interaction with nature is part of teaching methods, not a rare event. The fact that teachers reported increased energy and physical confidence demonstrates that continued engagement in ecological activities helps children view their bodies as strong and competent. Practical experience shows that outdoor ecological activities are transformative, foster physical growth, and help children's agency and confidence develop within *their learning environment*.

Active Outdoor Play

“We are even creating our curriculum to be nature-based outdoor play. Children become more liberated and remain active”.

“Children also push the limits of their bodies by running, climbing, and exploring outside. Such active play occurs automatically”.

The participants' focus on intentional curriculum design demonstrates that active play is included in the curriculum with a purpose and indicates a professional inclination toward ecological methods. The finding that children are freer suggests that outdoor environments are perceived as providing greater physical freedom and more expressive bodily movement than indoor environments. Furthermore, sustained active participation indicates the motivational and attentional advantages that nature-based settings offer. As teachers see it, ecological outdoor spaces serve as natural pedagogical environments that facilitate active play, sustain attention, and support thorough learning.

Theme 3: Connectedness and Belonging

Early childhood teachers also understand outdoor spaces as social spaces where children develop relationships and a sense of belonging. Shared nature activities help children interact freely,

cooperate, and build peer relationships. These experiences help children realize that ecological contexts favor inclusive engagement and that they belong to a group rather than being isolated individuals.

Socio-emotional connectedness

According to the teachers, belonging is not limited to other children; it also includes an emotional attachment to the surroundings, meaning that social connectedness is formed through relationships, shared experiences, and place. Ecologically, communities are created through phenomenological practices, in which bonds, recognition, and identity are built.

Participant F and W shared;

“When children are left to play and work together, their communication is more collaborative outdoors. Their ecological activities have increased their sense of belonging”.

Early childhood teachers perceive outdoor ecological practices as the environment where social transformation can take place. Practices of increased collaboration indicate that nature-oriented actions foster cooperation, negotiation, and mutual support among children, making them less competitive and more inclined to participate collectively in ecological activities.

The increase in children's sense of belonging mentioned presupposes that these practices have socio-emotional effects on children beyond physical benefits. Teachers consider ecological outdoor spaces a community of practice, where common practices foster social connectedness, inclusiveness, and a sense of community in the classroom.

“Nature encounter experiences have established deeper peer relationships. Children identify with one another and with the environment”.

The demonstration highlights early childhood teachers' belief that ecological practices are worthy pedagogical environments. It focuses on shared experiences of nature, depicting outdoor experiences as a social context in which children build peer relationships.

These experiences foster a sense of unity that goes beyond one-on-one play and allows children to bond through exploration. The idea that children are connected with others and their surroundings implies that affiliation is both social and ecological.

The cooperation of ecological activity

Teachers are exposed to cooperative ecological practices that are naturally attractive to children, as these activities engage them in shared work that encourages them to share, negotiate, and take responsibility for their work together. Such lived experiences demonstrate that collaborative ecological activities help develop prosocial behaviors and reinforce peer relationships. Teachers perceive cooperative interaction with the environment as an important context for developing social learning and a sense of community in early childhood settings.

Participant I and H shared:

“Ecological activities in our environment are never carried out individually. This has promoted team work and collective ownership”.

“Children also get to negotiate, help and care together through a cooperative type of environmental work. Such experiences have remodeled our classroom culture”.

Such lived experiences summarize early childhood teachers' experiences with ecological practices as essentially collective pedagogical processes. The educator's emphasis on group-based ecological work means that cooperation is part of daily life, making children active participants in environmental stewardship. The noted improvement in teamwork and shared ownership means that children do not just interact as a group; they are developing a sense of responsibility for their actions and learning.

Discussion

The study observed the relationship between ecological literacy and children's sustainable well-being. The participants voiced their support and highlighted the need to incorporate ecological practices in ECE for children aged 3 to 6 to foster lifelong relationships with nature. The themes were interpreted to highlight the connection between ecological literacy and practices in ECE academic environments and children's physical, socio-emotional, behavioral, and psychological well-being (Danahy, 2024). This age, in particular, needs connections among all ecological components to strengthen bonds that can help children develop a long-lasting relationship with nature.

Differing behavior in the outside or naturalistic settings. Their emotions are less tense; they become more active and curious about nature (Tamblyn et al., 2024). They ask questions about living things and what they see around them, such as trees, birds, and water. Through lived experience, teachers view cooperative ecological work as an important social environment in which children form meanings of cooperation, interdependence, and community in early childhood. Inquiry and curiosity in children are among the most desirable behaviors, as they promote learning, problem-solving, and the ability to critically analyze processes through deep observation.

Ecological spaces are viewed by teachers as being emotionally and socially connective, fostering relationships, place attachment, and community. It is also known that ecological practices encourage healthy behavioural tendencies that help children stay in touch with nature throughout their lives, supporting their health (Khayankij, 2024). Connection with peers and other individuals in their environment is not the only need, yet interacting and connecting with natural phenomena are also desirable to enhance various dimensions of children's personalities, such as observation, emotional and social interaction, psychological fulfillment, and being physically active in a natural environment, which can be enhanced through ecological pedagogy in academic settings (Arda Tuncdemir, 2025).

Early childhood teachers expressed their pleasure with children's interest and participation in ecological activities. This raises awareness of the significance of human and ecological connectedness, which can produce peaceful, calm people in society. By motivating children to engage in such activities, it will be possible to ensure they are connected to ecological trends in their lives.

Conclusion

Early childhood education provides various opportunities for children to grow. Children are not only able to understand themselves but also keen to explore their environment. Children aged 3 to 6 are especially inquisitive and curious about exploring their environment. To satisfy their urge to seek and observe more, naturalistic and ecological practices can be promoted in children, helping them be more focused and observant. They can connect with nature on various levels, such as

emotional, psychological, social, and physical connectedness, to promote a healthy bond with the ecological components surrounding them.

The study aimed to elaborate on the need for ecological practices in ECE by interpreting the voices of participating teachers who are directly involved with children and who observed them grow in an ecological environment. They have established the need for ecological practices in education and extracurricular activities to promote harmony in children's behaviour and enhance children's holistic well-being.

Limitations of the Study

The study was limited to early childhood educational settings, and future studies can be conducted at the primary level, as children at this stage also require practice in ecological practices to improve their well-being. More comparative research can be conducted on public and private schools to examine the various literacy practices they use. This was qualitative, small-scale research conducted only in Islamabad, as the study was limited to six schools. The research has the potential for growth and can be conducted on a larger scale.

The research was restricted to children aged three to six years to meet the research objectives. It participated only in private schools in Islamabad, where ecological practices can help promote sustainable well-being in a particular geographic and institutional context. The incorporation of different academic environments might yield different results due to differences in the infrastructure that enables naturalistic practices. The choice of early childhood settings with similar facilities narrowed the investigation to practical activities, teachers' perceptions, and the need for ecological literacy.

Conflict of Interest

The authors showed no conflict of interest.

Funding

The authors did not mention any funding for this research.

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