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Original Research

Understanding the Forest School Concept: Seeing the Link Between Pedagogy and Environmental Conservation

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Abstract: This exploratory study examines the extent to which forest school implementation is reflected in three selected schools in the coastal region, serving as case studies. To identify similarities and differences across the three cases, a case study approach using qualitative content analysis (QCA) was employed, generating two datasets—observations and interviews—from different stakeholders: students, administrators, and teachers. Findings reveal that the schools have different approaches, levels, and extents of adapting and integrating the forest school into their curriculum and instruction, with private schools exhibiting the most comprehensive integration. Despite these disparities, all schools share the same priorities in advancing the concept by promoting nature-based pedagogy that transforms content and spaces in an environmentally conscious, ethical manner, and by preserving the environment through education. Moreover, community participation emerged as a binding element that enables schools to elicit support and funding from different stakeholders. The findings of this study are intended to highlight common features and, possibly, indicators that can guide educators in designing schools that integrate the forest school as a response to the urgent need to raise students' consciousness through schooling.

Keywords: *Forest School, Nature Pedagogy, Exploratory, Community Participation, Curriculum*

Introduction

In recent years, educational practices based on the forest school concept have gained traction nationally and internationally. Climate change and human-made factors are driving schools' responses to issues that directly affect people, especially students. In countries like Ecuador, where natural disaster preparedness programs face challenges due to extreme climate variability, mitigation strategies and preventive measures, such as incorporating climate themes into teaching, are key to a sustainable response.

The idea of a forest school can be viewed as both a concept and a model, with the distinction lying in its pedagogical scope and the extent of its implementation in schools. The forest school concept refers to a broader pedagogical approach that emphasizes strengthening

learning through regular, experiential, child-centered engagement with the natural environment (Egan et al. 2022), highlighting the basic principles that characterize outdoor learning. In contrast, the forest school model is the operationalization of the principles found in the concept and extends to cover curriculum design, teacher roles, and infrastructure used to put the forest school concept into broader action: an outdoor education, not just a pedagogical approach, which strengthens learners' physical, social, and cooperative skills (Dabaja 2023).

The Forest School Association (n.d.) specifies six core principles: long-term, experiential, inquiry-based, outdoor education (Dabaja 2023), risk-taking in approach, and learner-centered. The forest school is long-term and not just one field trip. Students are engaged in experiential and inquiry-based activities that involve risk-taking tasks, all aimed at immersing them in outdoor education that places primary importance on students as the center of the teaching–learning process, allowing them to define their pace and interests.

In Ecuador, institutions promote the forest school concept at various levels of curricular and content integration. These schools represented diverse contexts in their understanding of forest school, whether as a concept or as an envisioned model. They also demonstrated alignment with an environmental educational approach that reflected a shared sustainable culture, despite their different contexts.

To analyze how forest schools are developed in the country, an exploratory approach was adopted, with the selected schools serving as cases and data collected through field notes and interviews. This approach provided an in-depth view of whether the schools' implementation reflects a concept or resembles a model.

Despite growing interest in integrating environmental issues into schools, there remains limited understanding of how to implement them successfully while taking into account each school's context (Mwendwa 2017). After the school visits in this study, it is evident that each school has a different understanding of the forest school concept, although they share certain characteristics and practices. Diverse ways of adapting a concept suggest a lack of a common framework for forest schools; the flexibility and adaptability in curricular integration reflect the absence of a common policy within the country's education sector.

The diverse perspectives on implementing the forest school concept provided impetus to explore its implementation further; thus, this study aims to probe deeply and generate findings on its implementation in the selected schools. Further, the study seeks to determine best practices and analyze strategies that can be replicated or adapted in the future to promote environmental education in schools in Ecuador. Data collection and analysis highlighted similarities and differences among the three schools, particularly in their pedagogical approaches, curricular principles, teaching strategies, and learning targets.

Literature Review

Defining the Forest School: Concept and Model

Exposure to nature has long been recognized as beneficial for human health and well-being worldwide. However, in industrialized societies, technological advances and urban development mean that children spend less time in nature, altering their lifestyles and limiting opportunities to develop basic skills and build healthy relationships among themselves (Mann et al. 2022). Evidence indicates that after the COVID-19 pandemic, there is a need to promote educational approaches that help young people grow as individuals (Sella et al. 2023).

Inspired by the Scandinavian "place-based learning" approach, the forest school approach integrates nature into its philosophy, curriculum, and environment, with children typically spending most of their day outdoors in immersive nature experiences (Barrable and Arvanitis 2019). In particular, forest schools aim to provide an alternative to traditional schooling by maintaining constant contact with nature through regular sessions, rather than one-off or infrequent visits; to encourage children's nature connectedness in a woodland or natural environment, fostering a relationship between the learner and the natural world through learner-centered processes; and to promote holistic development to foster self-esteem, confidence, independence, and creativity (Fundación Entreculturas 2013). In this type of place-based learning, the concept is extended to reflect a forest school implementation model, in which curricular adaptation shapes teaching methods that incorporate forest school principles into students' activities and assessment tasks.

The implementation of forest schools is gaining popularity in schools and has spread worldwide across multiple contexts (Knight 2016). The first documented experience came from the Scandinavian school called Udeskole—Forest school in 1950 (Pérez de Ontiveros Molina 2021). Its connection with education has been studied extensively in the United Kingdom, Australia, New Zealand, Canada, and Germany. This model has multiple benefits, which Dabaja (2023) attributes to the promotion of children's physical and emotional development and holistic well-being (Harris 2026; Knight 2018; Sella et al. 2023) However, there are challenges, including the additional costs identified by Dabaja (2023), such as human resources, logistics for outdoor activities, and investments in teacher training and safety.

Comparative Views of the Forest School Model

As a model, UNESCO (2025) builds on the idea that natural spaces can be classrooms without boundaries, extending climate education. represents a clear move away from an abstract, primarily cognitive approach to learning. Mann et al. (2022) also define a forest school as experiential learning activities conducted off school grounds, in places such as parks, forests, and other outdoor spaces. Both UNESCO and Mann et al. (2022) consider the forest school

a form of education that occurs through direct engagement with natural environments. However, there is a difference in scope: Mann et al. (2022) extend the idea that a forest school can be any outdoor environment serving kindergarten through Grade 12, whereas UNESCO focuses only on early childhood stages. The point of convergence of the definitions of forest school is its place-based orientation characterized by a physical space—not necessarily a physical forest as existing—but a space that diversifies the learning environment of students where content and learning tasks emanate from the environment.

There are other operationalizations and social constructions of forest schools in other contexts. In Spain, the forest school is an alternative approach focused on early childhood education (Netzer et al. 2026b); in Chile, it is considered an informal approach founded on environmental education. Diverse approaches to forest school exemplify what Cayul (2021) refers to as cross-curricular topics that develop environmental awareness and aim to influence people's way of life and regard for their surroundings.

Cultural Dimensions of the Forest School

In other studies, such as Moreno et al. (2025), the value of forests is emphasized and tied to people's memory, identity, culture, and education. In their works, the people's voice is captured, highlighting the importance of tradition and lived experiences, in which the notion of the "forest" connotes a sense of belonging to nature and culture. Preserving nature is preserving culture; thus, any environmental threat—forest degradation and extreme climate change—is viewed as a risk that the community, particularly the school, must respond to.

In some works, such as Moreno et al.'s (2025) study, the authors captured people's voices in their efforts to preserve their traditions and portrayed the richness of the forest as a reality connected to the weather and spirituality, thereby strengthening the physical connection to nature itself. Further, the preferential care for the forest is deeply rooted in people's heritage, transmitted as intergenerational knowledge that promotes respect for nature and its connection to people's daily lives.

On the Ecuadorian coast, the forest school concept reflects the people's desire to address the challenges posed by climate change, which threatens their lives (Netzer et al. 2026a). Pérez de Ontiveros Molina (2021) states that the forest school model is an alternative approach that is not limited to the forest, since it can take place in different spaces, for example, on the beach, in parks, in the desert, in the mountains, in gardens, and in vegetable patches.

In international contexts, the forest school concept serves as a model focused on a specific stage of schooling—early childhood education; however, its validation and recognition remain limited (Bruchner and Aragón Rebollo 2021; Netzer et al. 2026b). In Spain, there are around forty projects for alternative schools, but only one has been formally approved by the National Curriculum Committee. This school, called Cerceda Forest School, primarily serves preschool children. Cayul (2021) describes a similar case in Chile, where the forest school

model is considered an alternative or informal approach grounded in biocentrism, environmental sustainability, good living, place- or context-based learning, community, and an intercultural approach to the management of natural resources. As stated by Cayul (2021), environmental topics are cross-curricular nationwide, covering climate change, pollution, sustainability, and environmental education, as well as principles, values, attitudes, and behaviors throughout the program of study. Canaza-Choque (2019) indicates that the aim of the national program is to develop environmental awareness that influences people's lifestyles through informed decisions to reduce their footprint. Additionally, Díaz et al. (2021) conducted a study with 217 sixth-grade Mexican students using a structural equation model. The regression coefficients were positively related to values, skills, attitudes, and pro-environmental behavior, confirming that environmental education is significant and should continue to be promoted through teaching practices and the use of didactic materials.

Correspondingly, Gulašová et al. (2025) highlight that experiential and exploratory learning approaches grounded in forest schools' pedagogy contribute to the development of motor, social, and communicative skills. Thus, lectures, field notes, and discussions represented direct engagement and yielded positive feedback on their work. Hepworth et al. (2025) support forest school practices, indicating that after prolonged exposure to the forest, children reported positive mood outcomes, cooperative behaviors, and felt less exhausted, calmer, and happier. Similar findings were reported in an ethnographic case study conducted by Patel and Ehrenzeller (2023) in India and Germany. Despite distinct cultural and contextual differences, nature was seen as a "peace educator" promoting well-being and inner peace. In addition, the combination of activities in forest school spaces provides learners with the opportunity to increase their motivation and interest in learning, as the outdoor environment promotes physical and mental engagement, leading to a more autonomous and personalized learning journey (Sarı and Aydoğdu 2026). The far-reaching influence of the forest schools concept in helping learners see the environment as a key extension of themselves and schooling implies that its curricular implementation must adhere to a consistent and reliable planning structure to avoid what Coates and Pimlott-Wilson (2019) refer to as the forest school as merely occasional trips outside of their usual learning space. The lack of training for implementers, such as teachers, could be one of the underlying reasons for weak, ineffective implementation (Knight 2024).

Challenges in Forest School Implementation

Despite the forest school concept's potential to innovate environmentally conscious teaching, challenges remain, particularly in developing the human capital—teachers and administrators—to carry out authentic implementation (Leather 2018). This does not render it a fashionable approach to teaching; instead, it demonstrates a long-term, more consistent

approach (Barrable and Booth 2020) that helps different school stakeholders promote a culture of environmental care and protection.

The varying approaches to forest school implementation across different places and contexts reflect diverse understandings of its principles. In Ecuador, forest school implementation reflects people's respect for biodiversity and ancestral wisdom, which play a central role in the construction of values and identity (Hohenthal and Veintie 2024). Based on related studies, integrating the forest school model in the country requires an interdisciplinary approach encompassing pedagogy, ecology, and sustainability (Fundación Imayamana 2020). Exploring the concept and model is key to integrating their elements into the educational system, highlighting their experiential approach aligned with the country's environmental challenges.

Methodology

The study employed an exploratory case approach, in which a phenomenon is examined in real-world contexts to gain an initial understanding of the topic and capture themes emerging from the data (Yin 2018). Due to the limited research on the forest school concept in schools, the study aims to explore the nature and extent of its adaptation or integration in the selected schools. Despite the emergence of forest school-driven institutions in the country, few studies examine how the concept has influenced curriculum and instruction. The lack of clarity about what data characterize the context of forest schools is pivotal to choosing an exploratory approach. This reinforces Yin's (2018) idea of the value of exploring the contexts of phenomena that lack conceptual clarity.

The existence of multiple realities—the lenses of teachers, the views of students, and the approaches of curriculum developers—presupposes the use of exploratory data collection methods to capture diverse perspectives on implementation strategies in schools. Further, the study does not intend to test hypotheses or assumptions; instead, it aims to formulate possible conclusions from the data explored.

Data Collection Methods

Two data collection methods were employed—in-depth interviews with stakeholders and observations of the schools—to determine the nature and extent of implementation and integration of the forest school concept in three selected schools in the country's coastal region. Interviews were facilitated with stakeholders using interview guides, after which recorded audio was transcribed, processed, and analyzed. Similarly, observation guides were used to document classes and interactions. These schools were purposively selected for their curricular innovation and for integrating environmental strategies into their instruction and assessment.

The Selected Cases

The selected schools represent three distinct cases that share common characteristics with other schools, yet each reflects unique traits that set it apart. Case 1 is a semi-private school that charges minimal fees to its students because it receives government funding. Case 2 is a private school that charges full tuition and miscellaneous fees to its students, whereas Case 3 is a public school that charges no fees. The selected schools represent the three general types of schools in Ecuador, where infrastructure, curriculum development, and resources influence the implementation of a teaching innovation, such as the forest school, in students' learning processes.

Data Processing and Analysis

Data were coded from transcripts of interviews with various stakeholders and from classroom observation notes. Each case or school served as one dataset, and these datasets were categorized as either interview or observation data. Data were coded using the qualitative content analysis (QCA) approach (Schreier 2012), a method that hierarchically organizes codes and categories into themes, following a systematic yet flexible approach.

Data Validation

Ensuring methodological rigor was crucial to this exploratory case-based study design. Triangulation was achieved through constant comparison of two datasets—interview transcripts and observation documentation—collected from different stakeholders—teachers, students, parents, and administrators. Observational data allowed for the examination of practices, such as composting, forming assemblies, and diverse classroom-environment dynamics. Interviews provided valuable insight into curriculum implementation from both administrators' and teachers' perspectives. Similarly, student interview data served to verify administrators' and teachers' responses.

Establishing points of convergence in the data, or similarities across the two datasets, strengthened the data's credibility. This was evident when administrators in all schools emphasized the importance of environmental governance and the need for their institutions to adhere to it. These data were corroborated by observing the infrastructure in place in schools, which different stakeholders confirmed during interviews, highlighting ecological responsibility as central to institutional identity. Differences between schools were examined critically, thus completing the triangulation phase.

Saturation was reached when no new results emerged from the two datasets—interview and observation data—and the patterns were consistent across cases or schools. Despite each school having particularities, these are the distinct characteristics of the school that constitute

a case. Due to the exploratory nature of this study, saturation was conceptual, reflecting its exploratory design.

Results

Case 1: Semi-Private School

Figure 1 shows the three categories that emerged from the codes extracted from the observation and interview transcripts.

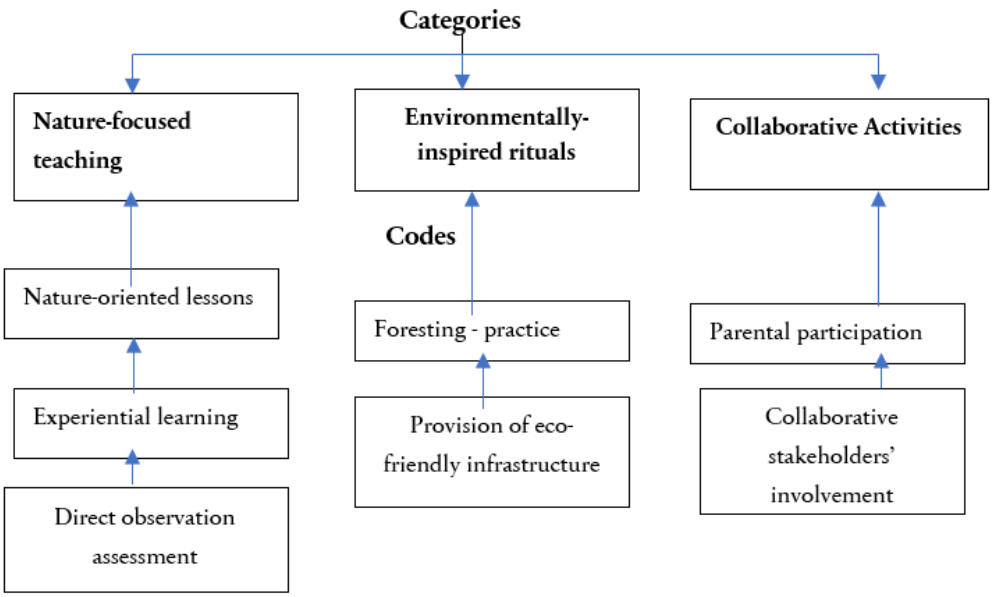


Figure 1: Forest School Implementation of Case 1: Semi-Private School

The first case is a green school that is located in Manabí Province, having approximately three hundred students from early childhood through high school, with each class averaging thirty students who study from 7:30 am to 13:45 pm. There are fifteen teachers with graduate degrees in Education working at the school, of whom eight are members of MinEduc and seven are from a nonprofit organization. The school charges a minimal fee, and most students come from low-income families.

Supplementary materials include music training manuals and readers on values and citizenship. Learning is organized around projects, with no age-based boundaries. Decision-making on important policies involves various stakeholders, such as parents, school administrators, and the board of trustees, particularly when implementing projects and activities.

The school's pedagogical model is distinct, integrating nature-oriented lessons that emphasize love and respect for others, and a strong emphasis on civic education, as reflected in its daily meditation activities that promote love, peace, rectitude, nonviolence, and truth. A teacher mentioned that "The school philosophy permeates all the decisions I make, including love and care for nature" (I5VT). The school has several learning environments—a science laboratory, an arts room, and a mathematics area—that have received support from international funding agencies. The school's regard for universal values reinforces its commitment to environmental care, thereby strengthening its integration of the forest school concept into its curriculum, instruction, and assessment. Experiential learning is pivotal in developing students who are aware of the context and the delicate environment in which they are situated. Assessment in this school depends heavily on direct observation and observational documentation, which are discussed during the weekly learning circles, as mentioned by one of the primary school teachers: "Most of the things I do with my students are documented with pictures, drawings, and galleries. Then we talk about these processes with my colleagues to reflect and learn" (I8ST).

This school integrates the forest school concept into daily educational practice by embedding specific principles in its school culture, as evident in its lived values, such as respect for nature, as evident in its anthem lyrics, wall signs, and actions to reduce, reuse, and recycle trash. The external integration of the forest school concept is evident in the school's infrastructure, which is largely made of recycled wood from the church, city hall, and other local buildings, as mentioned by the school's founder: "This dining table was made of wood in the church's door" (I5VT).

Further, integration is evident in the type of environmental ambiance the school has created, where the regenerative approach is reflected through its foresting practices using endemic species, including Franji Pani and Gran Verde, as well as trees brought from India. Students are on the front lines of demonstrating what is taught, as evidenced by the project called "Nature Guardians," in which all students are responsible for protecting a plant or animal in the school space. Coexistence is evident in the presence of domesticated animals throughout the school as part of the school community. One student stated, "We have a boa constrictor hanging in the open auditorium; did you see it? It is not dangerous; it likes to participate in the school events" (I3HSS). Additionally, there is space for composting food leftovers and wood. This fertile soil is used for planting fruit trees and vegetables. Thus, recycling, composting, and reforestation are just some examples of how the school aligns with the core principles of forest schools. This green school not only encourages experiential learning but also fosters daily ecological awareness.

Case 2: The Private School

Figure 2 shows the hierarchical organization of the codes that point to the three categories.

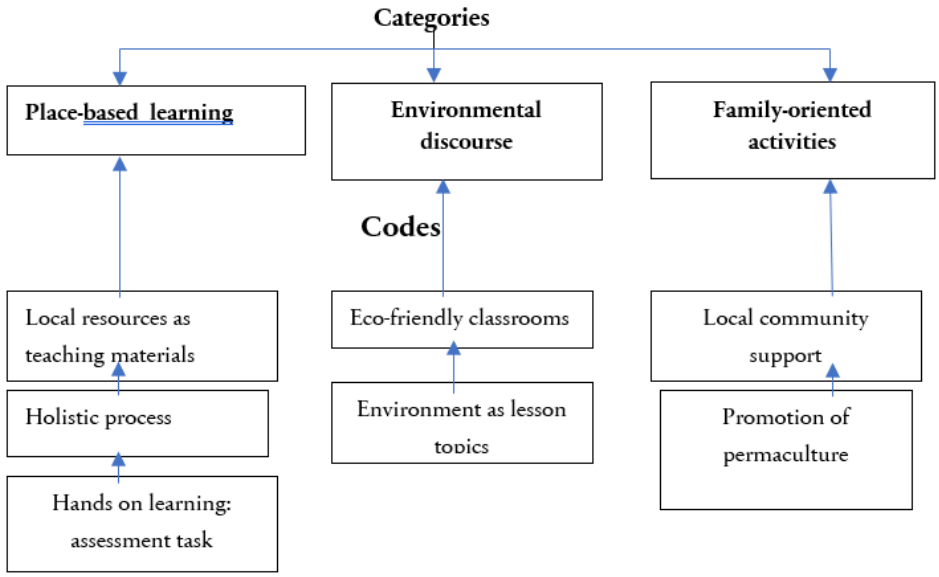


Figure 2: Forest School Implementation of Case 2: Private School

The second school is a private bilingual institution where English and Spanish are the languages of instruction. It was founded in 2020 in response to parents' concerns about school conditions during and after the pandemic; some schools were closed due to a lack of financial resources, and around twenty-seven families lacked access to education for their children. After researching different school models, the founders of the founders found inspiration in the philosophy of a green school in Paraguay. Their research led to the creation of a school, supported by the community and grounded in sustainable environments, where students develop real-life competencies and a love of nature.

The school began with six students who received instruction in a small cabin. From this small class, it has grown into a manageable population. Through its educational plan and concept, it has become popular in Ólon, a coastal town. At this school, students usually participate in an eight-week program similar to a summer camp. As the school population grew, the school administrators eventually enlisted volunteers and later hired additional teachers to sustain the initiative. Today, the school occupies 5.4 hectares surrounded by endemic trees and a river. It has its own carpentry space and has eco-friendly classrooms, where they use bamboo as the main material to build cabins, furniture, and playground elements. The founder's background as a tourism engineer, knowledge of Ecuadorian ecosystems, and ecological visits to the Amazon region have contributed to the school's vision and its concrete implementation.

Currently, there are thirty-six students distributed across four groups, representing different educational levels. According to the founders, the teaching approach is primarily holistic, with an emphasis on tailoring instruction to students' individual learning styles. They believe in students' ability to achieve anything they dream of, as long as they work diligently. The school follows the American curriculum and is accredited in the United States of America as a homeschooling institution. In fact, the school founder proudly commented that the first student to complete the program is applying to study at a University in New York (I14SF). This model prioritizes creating experiences, exploration, and hands-on practices, since students' learning can take place in nature-based settings such as Olon. They also underscore the use of local resources, such as locally grown plants and animals, that coexist as sources of teacher-support materials.

At this school, students receive their lessons in different natural contexts—in half-open cabins with bamboo walls, in green spaces surrounded by endemic trees and filled with fresh air, and with limited use of technology by choice—which they believe reinforce the forest school concept. There is diversification in learning environments through the use of natural spaces to study life processes, such as concrete and real-time observation of the butterfly's life cycle. Aside from the forest space, students have access to a nearby beach where they participate in clean-up drives, and they have daily visits to the river that runs along the school's perimeter, where birdwatching and wildlife observation in natural habitats are part of the learning.

This school goes beyond using natural resources for teaching, playing in natural environments, or sightseeing at animals in their natural habitat; it incorporates permaculture concepts and elements, such as a biodigester and a dry composting toilet. This kind of practice promotes a lifestyle that supports the community by protecting and using natural resources sustainably and by teaching life skills to global citizens with an awareness of a better way of life, aligning with the core principles of a forest school model.

Case 3: The Public School

Figure 3 shows the codes that emerged from the datasets collected from the third case, or third school.

The third school is a public school under the Ministry of Education (MinEduc), located in Ayampe. It currently has thirty-four students from preschool (age 3) through seventh grade (age 12). Students aged 3–7 work with one teacher and those aged 8–12 with another. This reflects the multigrade teaching model, or "unidocente, bidocente y pluridocente" (single teacher, two-teacher, and multi-teacher), of the MinEdec, which characterizes the schooling system in rural areas. They employ a challenge-based learning system, and decision-making and communication take place through assemblies. Their pedagogical model is based on play-based learning with concrete Montessori materials donated by nonprofit organizations and volunteers. Learning assessment is conducted using documentation, including observation diaries. Various volunteers from other countries have contributed to teaching a sustainable

culture at the school. The teacher mentioned that "even though the number of students has decreased in the last year, the number of volunteers has increased" (I11ST).

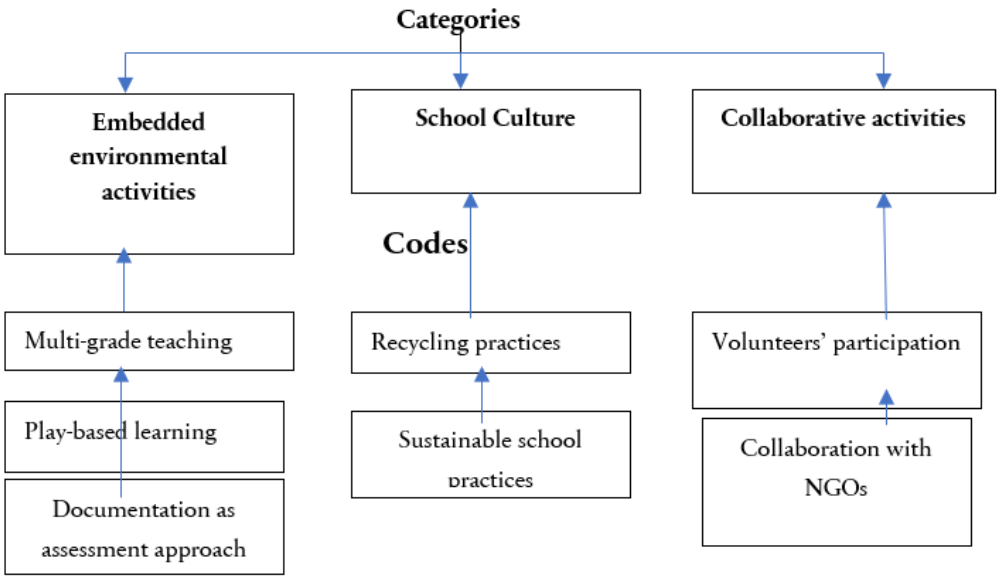


Figure 3: Forest School Implementation of Case 3: Public School

This institution exemplifies green or sustainable education for several reasons, including a curriculum that emphasizes sustainability, the use of the environment for active nature conservation, interaction with native beach flora and fauna, thoughtful space design, and the use of recycling, composting, and solar panels. In these learning environments, students strengthen their environmental awareness and sense of community. For example, in the school garden, children learn, with guidance from a community volunteer and a local government technician, to plant, care for, and harvest short-cycle crops, such as tomatoes and beans. This helps them reflect on food security for themselves and their families, as well as their responsibility in cultivating the garden. Children eat their meals on a large outdoor patio and then participate in various recreational activities. In the theater, they explore values that strengthen their environmental awareness through puppet interactions, covering topics such as caring for nature, sustainable resource use, and healthy eating. In the science laboratory, students conduct projects and experiments to develop their scientific thinking on health and nutrition, among other topics.

The school curriculum includes educational field trips and extracurricular activities, such as hiking, sports, and horseback riding on the beach and in the mangroves; beach cleanups; visits to the local farm; and cooking, fishing, and pottery classes, with support from volunteer families in the community. Due to its privileged location on one of the most biodiverse and

attractive beaches on the Ecuadorian coast, the school shares the space with visitors, such as quails, iguanas, snakes, and squirrels. The school grounds are adorned with palm trees, colorful flowers of various species, and ornamental plants.

The school's infrastructure also supports the forest school concept. It has recycling bins and garbage collection containers for sorting waste, as well as solar panels, composters, and biodigesters. With the collaboration of the local government and non-government organizations (NGOs), the school receives technical support from an environmental organization, as well as resources, such as shovels, rakes, pickaxes, and other tools.

Data Analysis and Discussion

Data were analyzed using the QCA approach, in which categories were grouped into dimensions and properties, yielding themes at the end. Figure 4 shows the categories derived from the two datasets—observation and interview—from different stakeholders. Four themes were constructed from the ten categories that are linked to a specific theme. Each theme explains the nature of the implementation of the forest school in the selected schools.

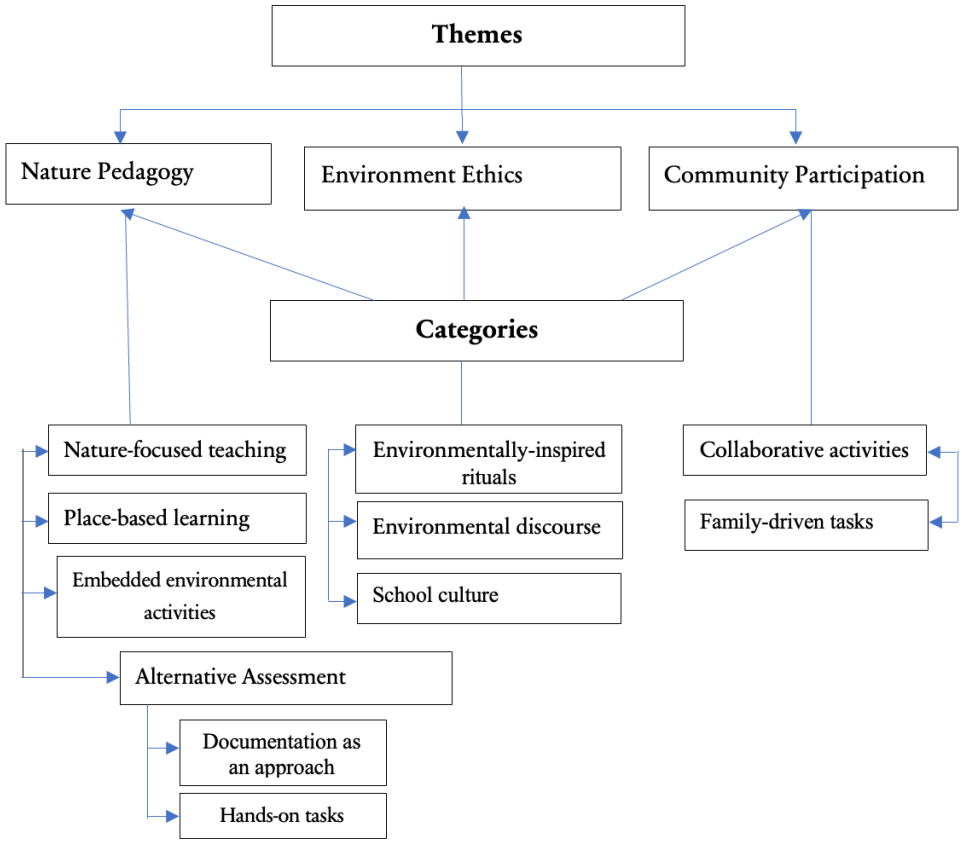


Figure 4: The Hierarchical Structure of the Coding Frame Concerning the Forest School Integration

Two datasets were generated from observations collected during on-site visits and in-depth interviews with various school stakeholders. Data were transcribed and coded to identify relationships and describe common patterns and distinct characteristics across the three selected schools. Rounds of interviews were conducted with stakeholders to probe aspects observed during observations but not further explored. Upon analysis of the data, four recurring themes emerged, each corresponding to an aspect of the forest school implementation. The first theme—nature pedagogy—refers to the type of pedagogy that characterizes the teaching–learning process, in which assessment emerged as an influential element, providing evidence of the significance of the pedagogy employed. The second theme is environmental ethics, which reflects a preferential regard for the environment and its condition, as reflected in the school's curriculum, students' activities, and learning rituals. Community participation is the third theme, as recurring categories point to a distinct characteristic of forest school: the community in which the school is situated participates and collaborates with students and teachers. Alternative assessment is another theme that emerged, but it is linked to pedagogy as it is linked to curriculum and instruction; thus, it is not separated and treated as independent from the theme, "Nature Pedagogy."

Nature Pedagogy

In all schools, nature was positioned as a structured element that serves as the core or foundation of the forest school. Daily routines and activities are designed to be carried out in open, semi-open, or ecologically rich environments, such as gardens, riverbanks, and bamboo cabins, affirming what Perez de Ontiveros Molina (2021) described: that the forest school concept can be carried out in diverse learning environments, which reflects authenticity and reinforces Leather's (2018) idea 16 about how forest school should be implemented. The reconfiguration of space allowed students to be in constant contact with nature, whether directly or indirectly, thereby promoting experiential learning, which Gulašová et al. (2025) emphasize as a pivotal aspect of forest school-driven learning.

In Case 1 (semi-private school), the composting systems and coexistence with animals were integrated into daily routines, thereby fostering responsibility among teachers and students. Not only did the school's infrastructure foster this daily responsibility, but the "nature guardians" initiative further promoted a model of ecological accountability, in which each student assumed the role of a living organism, thereby adopting an identity and values constructed from an environmentally conscious context.

In Case 2 (private school), ecological observation uses a space in the environment to facilitate experiential science instruction on the butterfly's life cycle, using a real butterfly that has undergone changes in contrast to the textbook-based explanation used in other institutions. The boundary between infrastructure and curriculum was blurred by integrating permaculture systems, enabling students and teachers to draw on the natural ecosystem while

leveraging abundant school resources and stakeholders' knowledge to maximize benefits for all. Recycling materials, cultivating gardens, and producing food exemplify permaculture practices integrated into the institution's forest school concept.

Case 3 (public school) features similar activities, including curriculum-driven initiatives, such as institutional agricultural activities, beach cleanups, and the use of solar panels, promoting the wise use of nature to its full potential. These practices demonstrate a paradigm shift from environmental education rooted in content delivery to ecological immersion in daily scholarly activities and routines. Ecological immersion, in which students engage in meaningful activities, facilitates the rapid absorption of the forest school concept, as these concepts are made real through activities that reflect their real-life use, thereby fostering holistic well-being (Harris 2022; Knight 2018) during the formation.

Environmental Ethics

Institutional culture is an important dimension that must not be overlooked. In each of the schools visited, sustainability was operationalized through rituals, material artifacts, spatial organization, and daily routines that emphasized the school's relationship with nature, affirmed what Attfield (2023) refers to as moral obligations, and strengthened that relationship (Meyer and Müller-Salo 2023). In this study, environmental ethics refers to the school's built-in regard and valuation of the environment through curricular and pedagogical accommodations that raise students' awareness about the importance of their connection with nature.

In Case 1 (semi-public school), a collective identity was cultivated through an institutional culture, manifested in their morning meditation rituals, barefoot classroom practices, and the constant use of recycled materials. These practices framed environmental respect not only as an expected form of compliance grounded in habits and routines but also as a moral and spiritual orientation.

Case 1 follows a communal philosophy in which each person contributes to environmental presentation and identity formation. Framing the forest school concept as a collective consciousness celebrates nature and culture, affirming Moreno et al.'s (2025) study on the connectedness of "people's identity and nature" and supporting Cayul's (2021) cross-cultural approach that covers broader themes, such as climate change and environmental education, using the forest school concept as the take-off point.

In Case 2 (private school), the deliberate minimal use of technology and the bamboo-based construction of the classroom reflected coherence between environmental discourse and institutional practice. The adherence to sustainable principles in this private school (Case 2) is not only theoretical but also practical and consistent. A consistent approach to learning content and environmental integration demonstrates consistency (Barrable and Booth 2020)

and good planning (Coates and Pimlott-Wilson 2019), which are pivotal toward a meaningful incorporation of environmentally-centered lessons.

In Case 3 (public school), the infrastructure is the most visible aspect of the school's integration of the forest school concept, with a strong presence of recycling bins, biodigesters, solar panels, and sustainable infrastructure (theater), reinforcing environmental responsibility at every corner and reinforcing its ethical and moral responsibility to the environment.

Overall, the three schools clearly demonstrate that environmental awareness becomes transformative when embedded within institutional habits, daily routines, and infrastructure. This clearly relates to the findings of Diaz et al. (2021), which confirm that environmental education and student behavior are positively related.

Community Participation

All schools demonstrated administrative initiative with varying degrees of close collaboration with families, volunteers, NGOs, and local authorities. The largest stakeholder group—the parents—demonstrates a high degree of involvement and commitment at each school. They held workshops and storytelling sessions and participated in beach cleanups and agricultural activities to foster a family-oriented atmosphere, in which each played a key role in helping the school achieve its environmental goals. In terms of infrastructure development and didactic materials, there was strong external support from international volunteers and NGOs, who dedicated time and money and shared materials directly.

The shared school administration across these schools exemplifies a community-driven, grassroots approach to managing the schools' daily operations. The multi-sectoral, multi-stakeholder approach to running the schools reflects a highly collaborative lens that helps the schools achieve their goals, and the involvement of other school actors—NGOs, foreign donors, volunteers—facilitates the implementation of the forest school concept through knowledge and expertise sharing.

Alternative Assessment

The assessment approach across all schools differed significantly from the mainstream assessment and evaluation strategies most schools employ. In all cases, the schools obtain information about students' knowledge and performance through alternative assessments, such as observation diaries, capstone projects, learning journals, and project-based learning outputs, which can be better gauged through alternative assessment due to its child-led orientation (Karavida et al. 2020) than the standardized, objective assessment activities.

Moreover, these schools prioritize understanding how students learn over the outputs they produce, reinforcing the importance of academic growth and socio-emotional development, and emphasizing that students do not undergo a uniform learning pathway

(Harris 2026); thus, implying the individual differences among learners as key in using alternative assessment rather than objective tests. In all cases and schools, assessment plays a key role in reflecting on the effectiveness of integrating the forest school idea into the curriculum and on the relevance of instruction that promotes students' skills in integrating key concepts across subjects and incorporating them into the outputs they present. Also, this kind of assessment reflects an epistemological orientation that emphasizes the potential of place-based education in providing significant and meaningful learning for all.

Challenges

Despite the positive outlooks of the schools selected in this study, the three schools differ in the extent and nature of their forest school implementation. Case 1 (semi-private school) uses a framework that combines the national curriculum with partnerships with NGOs. Most NGO staff have knowledge of environmental education, which helps integrate this content into the national curriculum. Moreover, philanthropic support provides the financial resources to fund programs and improve infrastructure, thereby facilitating the integration of forest school principles while remaining formally established within the Ecuadorian educational system.

Case 2 (private school) represents a grassroots entrepreneurial initiative that operated under the American homeschool accreditation system. The school exemplifies a real forest school that emphasizes the importance of using nature pedagogy as the core element in planning lessons; however, due to the foreign adaptation of the US curriculum, it lacks the integration of local context in raising students' awareness about the link between environment and interculturality.

Case 3 (public school) is fully embedded within the public education system. Despite the infrastructure in place to integrate the forest school concept, low enrollment and a shortage of teachers and volunteers impede its full implementation. According to the teacher, the school received extensive support from volunteers and university student–teachers before the pandemic, who shared their knowledge of environmental awareness; however, this support was severely affected afterward. The lack of sustained professional development training programs for teacher training confirms Knight's (2022) idea that most forest schools identify this as one of the challenges that impede effective implementation.

Based on the schools selected for the study, the differences might suggest that forest schools in Ecuador are not structurally similar; rather, they are adapted to diverse contexts and approaches. The variation in governance and recognition pathways further suggests that regulatory flexibility and institutional support are critical to the sustainability and scalability of environmentally grounded pedagogical models.

Conclusion

Exploring the integration of the forest school concept in selected schools in Ecuador's coastal region shows that the nature, level, and extent of implementation vary across curricula, instruction, and assessment of the schools explored. Although the three cases—schools—share common elements, such as the incorporation of nature pedagogy, community participation, an environmental ethical guide, and assessment tasks, they also differ in how forest-school-related lessons are embedded in their curricula. Based on the findings, schools with more financial resources, such as the private school (Case 2), have more comprehensive and intensive implementation, as they have the means to adapt their infrastructure into environment-friendly classrooms, alongside teaching resources and the diversification of learning environments. In the semi-private and public schools, the implementation of the forest school concept is evident; however, a lack of human capital with expertise, such as teachers and international volunteers, impedes deeper and more effective integration, particularly in curricular content and instructional implementation. Further, based on the data gathered, the implementation of the forest school concept has not reached the level that constitutes a model of school governance and curricular innovation, as the changes that are institutionalized do not reflect a thorough structure embedded in the institution's academic life, with experts on forest school pedagogy and holistic development, including guidelines for environmental preparedness and risk-management plans.

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The authors declare that generative AI or AI-assisted technologies were not used in any way to prepare, write, or complete this manuscript. The authors confirm that they are the sole authors of this article and take full responsibility for the content therein, as outlined in COPE recommendations.

Informed Consent

This study was conducted with the informed consent of all participants. Participants were informed of the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any time without penalty. Written consent was obtained from all participants. The study protocol was approved by the Universidad Nacional de Educación Ethics Committee.

Conflict of Interest

The authors declare that there is no conflict of interest.

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