

Outdoor Literacy Pedagogy: A Grounded Theory Analysis of Early Childhood Learning in Natural Environments

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Abstract

This qualitative study explored the role of outdoor classrooms in fostering early literacy development, inquiry-based learning, and inclusive educational practices among kindergarten students in a STEM Title I school. Using grounded theory, the study integrated observational data, teacher reflections, student work samples, and structured surveys to examine how outdoor learning experiences influenced emergent literacy skills, social-emotional growth, and environmental stewardship. Findings revealed that outdoor classrooms promoted authentic literacy behaviors, including oral storytelling, vocabulary expansion, and environmental print recognition, while also enhancing collaboration, emotional regulation, and equitable participation among diverse learners. Educators served as responsive facilitators, modeling language, guiding inquiry, and supporting conflict resolution in flexible natural spaces. The outdoor environment functioned as a co-teacher, offering multisensory and interdisciplinary experiences that blended literacy with science, social development, and creative expression. Implications suggest that outdoor classrooms are powerful venues for literacy instruction when designed with intentionality, inclusivity, and alignment to academic standards. Recommendations for future research include longitudinal studies examining the long-term impact of outdoor literacy programs and professional development models supporting teacher efficacy in nature-based instruction.

Keywords: *outdoor classrooms, early literacy, social-emotional learning, environmental education, inquiry-based learning, inclusive education, nature-based pedagogy, grounded theory*

1. Introduction

As technology continues to shape modern learning environments, educators increasingly recognize the importance of reconnecting young children with nature,

as regular access to natural environments in early childhood has been shown to improve physical and mental health, foster social-emotional skills, and enhance school readiness [1]. Outdoor classrooms provide a unique and immersive setting that supports early literacy development, particularly oral language, vocabulary acquisition, emergent writing, and narrative storytelling. These literacy skills thrive alongside growth in social-emotional competencies and environmental awareness [2], [3]. Outdoor classrooms promote focus, curiosity, and student engagement by offering a multisensory, screen-free environment that supports both cognitive and emotional development [4], [5].

At first glance, it may look like play. It's 10 a.m., the sun is shining, birds are chirping, and a group of kindergarten students runs into the school's wooded outdoor classroom, rain boots on their feet and excitement in their voices. They eagerly gather twigs, swing from low branches, and move freely across the grassy to wooded area. But beneath this joyful activity lies something more profound. One child raises a stick and declares, "This is my pencil." Another, typically quiet in the indoor classroom, kneels beside a worm in the dirt and begins to tell the story of how he plans to save it from the heat. These are not just playful moments, they are episodes of oral language development, collaboration, and emotional development. And notably, they are taking place outside the confines of the traditional classroom.

The idea for this study emerged during early observations of children engaging in rich, language-filled play outdoors, prompting us to ask whether the most impactful literacy learning might be taking place beyond the classroom walls. As early literacy educators seek to meet developmental standards, promote equity, and respond to growing concerns about screen time and student disengagement, this study explored the potential of outdoor classrooms as authentic, inclusive, and dynamic environments for literacy learning.

Research indicates that regular engagement with outdoor learning environments enhances cognitive development, language acquisition, and emotional well-being in young learners [6], [7]. Yogman et al. [8] emphasized that play is not frivolous, but critical to brain development and executive functioning, suggesting that the outdoor classroom is not only developmentally appropriate but neurologically beneficial. Studies have also found that gardening, outdoor play, and nature exploration promote skills such as vocabulary development, observation, and storytelling [16], [9]. To better understand how outdoor learning environments influence literacy development, this study examined experiences within a nature-based classroom in a public-school setting. The following review of literature situates this inquiry within existing research on early literacy, nature-based education, and social-emotional development in nature-based environments.

2. Literature review

Outdoor learning has gained increasing attention in early childhood education, particularly for its potential to support literacy development, social-emotional growth, and interdisciplinary learning [10]. This review synthesizes relevant literature across four key areas: (1) outdoor learning and early literacy, (2) social-emotional development in nature-based environments, (3) theoretical frameworks that inform outdoor pedagogy, and (4) identified gaps in current research. Together, these strands provide the conceptual grounding for the present study and highlight the need for empirical work that examines outdoor literacy instruction in natural settings.

2.1. Early literacy development

The foundational years of literacy development, typically spanning from birth through age eight, are critical, with early experiences in language and reading laying the groundwork for future academic success [11]. Recent research underscores the importance of integrating outdoor environments into early literacy instruction, highlighting the benefits of nature-based learning in fostering key literacy skills, particularly oral language development and phonological awareness [12], [13].

Oral language development is central to early literacy and is emphasized in both the science of reading and most early literacy standards [14]. Outdoor settings offer authentic opportunities for children to engage in meaningful conversation, storytelling, and vocabulary expansion through social interaction and

shared inquiry [1]. For example, observing and describing a bird's movement or narrating the steps of building a structure with sticks allows children to practice complex language structures in context-rich settings [13]. This kind of dialogic interaction supports expressive and receptive language growth, key building blocks in the literacy continuum [14].

The science of reading, a robust body of interdisciplinary research, emphasizes explicit and systematic instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension [14]. Nature-based environments can support these components in developmentally appropriate ways. For instance, children may explore sound patterns by mimicking animal calls or clapping syllables of nature-based vocabulary, reinforcing phonological awareness through playful interaction [12]. Emergent writing is also supported when children use natural objects to form letters or label findings in journals, bridging oral and written language in meaningful ways [10].

High-Quality Instructional Materials (HQIM) are essential to delivering effective literacy instruction and are increasingly expected in early education programs aligned with state standards. In Tennessee, High-Quality Instructional Materials (HQIM) are central to early literacy reform, providing educators with structured, research-based content aligned to the science of reading [15]. The SCORE report emphasizes that effective HQIM use, paired with professional development, ensures all students, including those needing intervention, receive consistent, high-quality instruction across core and supplemental settings. When paired with outdoor environments, HQIM can extend beyond the classroom by using nature as a text, integrating vocabulary from thematic units (e.g., life cycles, habitats) into hands-on, language-rich lessons. This integration enables a holistic approach to foundational literacy development that is both experiential and standards aligned.

Current research supports outdoor learning as a viable and enriching context for early literacy instruction. When informed by the science of reading and supported by HQIM, nature-based experiences can promote oral language development, phonological awareness, and emergent literacy skills in authentic and engaging ways [13], [14], [12]. These findings reinforce the need to view outdoor classrooms not simply as enrichment, but as meaningful sites of foundational literacy development.

2.2. Outdoor learning and early literacy

Research increasingly supports the use of nature-based environments to foster foundational literacy

skills in early childhood [12]. Studies have shown that outdoor play environments offer authentic opportunities for oral language development, narrative construction, labeling, and emergent writing [16], [7]. Kiewra and Veselack [9] emphasized the creative potential of natural materials to promote literacy and storytelling through imaginative play. Similarly, Louv [2] coined the term “nature-deficit disorder” to describe the cognitive and emotional challenges that arise when children are disconnected from the natural world, a gap outdoor classrooms seek to fill. These studies directly inform our research by highlighting how outdoor environments not only nurture early literacy but also create the conditions for emotional expression, collaboration, and self-regulation, all key components of social-emotional development [12], [16] [17], [9].

2.3. Social-emotional learning outdoors

The outdoor environment not only supports academic goals but also nurtures essential social-emotional competencies. Yogman et al. [7] argued that unstructured play is foundational to self-regulation, collaboration, and emotional resilience. Research from Bohling et al. [6] suggested that sustained exposure to natural environments enhances children’s ability to manage emotions and work cooperatively, skills that are integral to literacy development because they support turn-taking in conversations, active listening, peer collaboration during storytelling, and persistence through challenging reading or writing tasks.

Yogman et al.’s [8] research enhanced our study by explaining how unstructured play in outdoor environments fosters self-regulation, collaboration, and emotional resilience, all of which are core social-emotional competencies that were consistently observed among students in our outdoor classroom setting.

2.4. Theoretical frameworks in nature-based pedagogy

Our study is grounded in constructivist learning theory and draws on several influential frameworks that position the environment and the child as central agents in the learning process. Montessori’s (1967/1995) concept of the environment as a “third teacher” suggests that carefully prepared surroundings can provoke curiosity, guide exploration, and extend learning without constant adult direction. This idea is especially relevant in outdoor settings, where natural elements invite open-ended play and spontaneous engagement with literacy-rich experiences.

Similarly, the Reggio Emilia philosophy, articulated

by Edwards et al. [18], emphasizes child-led inquiry, multisensory exploration, and the importance of documenting children’s thinking through symbolic representation. These principles informed both our observation strategies and interpretation of student behavior, particularly in how children narrated stories, used materials as text or tools, and collaborated in meaning-making.

Warden [19] further expands these perspectives by positioning the outdoor classroom as an interdisciplinary space where literacy, science, and social-emotional development intersect. Her work reinforces the value of unstructured time, natural materials, and responsive facilitation as essential components of meaningful outdoor learning.

Together, these frameworks provided the conceptual lens for analyzing how literacy development emerges in nature-based settings. They guided the study’s focus on child agency, teacher responsiveness, and the affordances of outdoor spaces for integrated learning. In doing so, they allowed us to conceptualize the environment not merely as a backdrop, but as an active and intentional co-creator of early literacy development.

2.5. Gaps in the literature

While interest in outdoor learning has increased, the field still lacks a comprehensive understanding of how nature-based environments support early literacy development across diverse educational contexts. Much of the existing literature focuses on social-emotional benefits or environmental education, with fewer studies exploring how foundational literacy skills, particularly oral language, phonological awareness, and emergent writing emerge through outdoor learning experiences. Even fewer investigations connect these literacy outcomes to the science of reading or examine how educators implement standards-based instruction in outdoor settings. Additionally, there is a gap in research addressing how teachers without formal training in nature-based pedagogy navigate and adapt their instructional practices. This study responds to those needs by offering a grounded theory analysis of literacy development in an outdoor classroom, illuminating both student behaviors and teacher decision-making in a real-world, public-school setting.

3. Research questions

This study is guided by the following questions: In what ways does the outdoor classroom enhance early literacy development in young children? How do educators facilitate and support literacy learning in

outdoor environments? What social and emotional benefits emerge from outdoor learning experiences? How does participation in outdoor classrooms impact students with diverse learning needs?

4. Significance to the Journal

This study and its findings are significant because, like Kiewra and Veselack's [9], research on creativity in natural outdoor classrooms, this study challenges the assumption that early literacy development must take place in traditional, indoor, print-rich environments. Whereas much of current early literacy policy and instructional design emphasizes standardized, text-based, and screen-mediated instruction [20], our study offers compelling insight that literacy can be embedded in play, exploration, and natural contexts, broadening what counts as meaningful literacy instruction.

The findings of our study align with the core interests of the *Literacy Information and Computer Education Journal (LICEJ)* by advancing contemporary conversations about flexible, inclusive, and multimodal literacy instruction. While this study focuses on nature-based learning environments rather than digital tools, it contributes to the journal's broader mission by emphasizing innovative pedagogical practices that support literacy across diverse contexts. Specifically, the study highlights how non-traditional learning spaces, like outdoor classrooms, can cultivate foundational literacy skills, oral language development, and collaborative problem-solving. These findings are particularly relevant to educators and researchers exploring technology-alternative approaches, equity in literacy access, and the integration of environmental and experiential learning into early childhood education. Additionally, the emphasis on teacher adaptability, instructional creativity, and student agency mirrors the journal's interest in preparing educators to meet literacy standards through innovative and contextually responsive means.

5. Methodology

This study employed a qualitative research design grounded in constructivist theory and interpretivist paradigms to explore how outdoor classroom environments support early literacy development, social-emotional growth, and environmental engagement among kindergarten students. Grounded theory methods guided the analytical process to identify recurring patterns and themes across multiple data sources. This design allowed for the exploration of student behaviors and teacher practices in a naturalistic educational setting.

5.1. Participants and sampling

The study focused on a convenience sample of approximately 35–40 kindergarten students enrolled at a rural STEM-designated Title I public school in the southeastern United States. Students were observed during their regularly scheduled outdoor classroom time, which occurred twice weekly. All students in the participating classrooms were included in the observation pool, and no individual student was singled out. In addition, five kindergarten teachers who facilitated outdoor instruction were recruited as participants and completed end-of-study surveys. The participant teachers had no formal training in facilitating outdoor learning with children. Instead, they relied on open-minded constructs, intuitive to what they thought to be true about the potential of outdoor learning opportunities. This inclusive sampling approach ensured a comprehensive view of typical classroom dynamics without disruption to instructional routines.

5.2. Setting and context

Tucked behind the school building, past a chain-link fence and a row of low shrubs, lies a wooded area affectionately known by teachers, students, and parents as “Wonderland Woods.” This outdoor classroom is not a neatly manicured garden or a formal play structure, but rather, an evolving landscape of learning opportunity. Winding dirt paths snake through tall trees, their branches forming a soft canopy that filters light onto the ground. Logs, tree stumps, and found rocks are arranged in unique ways, spaces children created to gather, sit, and talk with one another. There are no plastic signs, no bulletin boards, just the hum of birds, the crunch of leaves, and the spontaneous conversations of children at play. The space is alive with possibility: sticks become pencils, leaves become currency, and downed limbs transform into castles, restaurants, or jungle gyms. Learning emerges organically from what the wooded space offers. A hollowed stump becomes a reading nook. A pile of acorns triggers a counting challenge. A squirrel's sudden appearance sparks a student-led investigation about habitats.

Despite its charm, the area is structured with purpose. Teachers used visual markers to define safe boundaries, and materials like clipboards, magnifying glasses, and outdoor supplies were stored in crates that doubled as seating. Children identified the unmarked landmarks, like “the wedding chapel,” “the climbing branch,” and “the quiet spot.” These natural waypoints become part of the daily rhythm of learning, anchoring both movement and meaning.

Wonderland Woods functions as a third teacher, offering its textures, sounds, and unpredictability as instructional tools [17], [18]. It is not merely a backdrop for learning but a co-constructor of experience, inviting students to engage with literacy, science, and one another in meaningful ways.

5.3. Data collection methods

Data collection was multifaceted to ensure triangulation across data sources and perspectives. Methods included:

- **Field Observations and Reflective Journals:** Researchers documented detailed field notes during twice-weekly outdoor sessions over several months, capturing literacy behaviors, social interactions, and teacher-student exchanges.
- **Photographs of Student Work:** Images of children interacting with nature, labeled collections, drawings, and collaborative projects were collected to illustrate literacy application in outdoor contexts.
- **Teacher Surveys:** At the conclusion of the study, participating teachers completed surveys that included both open- and closed-ended questions on perceived benefits, instructional challenges, and professional preparedness related to outdoor literacy learning.

5.4. Data analysis procedures

Data were analyzed using grounded theory procedures, including open coding and thematic categorization. One researcher conducted the primary coding using online qualitative analysis software to identify distinct behaviors and concepts across the observational and survey data (e.g., storytelling, labeling, collaboration). Codes were then grouped into broader analytic categories, such as “emergent literacy behaviors” and “teacher scaffolding.”

Throughout the data collection and early analysis phases, the research team engaged in regular peer debriefing sessions to discuss observed patterns, reflect on emerging ideas, and ensure alignment between field experiences and initial interpretations. While theme development was led by the primary coder, these collaborative discussions informed the interpretation of findings and helped refine the final analytic categories. This reflective process enhanced the credibility of the study while maintaining ethical clarity about the roles of each team member in data analysis.

5.5. Measures of trustworthiness

Several strategies were employed to ensure the trustworthiness of findings:

- **Triangulation:** Multiple data sources (observations, teacher input, artifacts) were compared to identify consistent patterns.
- **Prolonged Engagement:** Data were collected over an extended period to ensure familiarity with the setting and reduce reactivity.
- **Peer Debriefing:** Research members participated in ongoing analytic discussions throughout data collection and interpretation to help surface alternative perspectives, challenge assumptions, and strengthen the credibility of emerging findings.
- **Thick Description:** Rich, contextual narratives and vignettes were used to ground findings in authentic examples.

5.6. Ethical considerations

This study was approved by the university’s Institutional Review Board (IRB). No student names or identifying information were recorded, and all participation occurred during normal school activities, minimizing risk. Students were not required to alter their behavior or complete any tasks beyond their regular outdoor classroom participation. Teacher surveys were anonymous and completed at a time of the participants' choosing. Additionally, all photographs of student work excluded images of children and were used only with school and teacher permission. The study adhered to ethical principles of confidentiality, voluntary participation, and minimal intrusion into the educational environment.

6. Findings

Using grounded theory methodology, six key themes were identified through systematic coding of observational field notes and teacher survey data by the primary researcher. These themes were refined through peer debriefing sessions with the research team, which provided additional insight and critical reflection. The resulting themes reflect consistent patterns in how outdoor environments supported literacy development, social-emotional growth, and instructional adaptability. Table 1 summarizes these themes alongside

representative evidence drawn from the study's data sources.

Table 1. Emergent Themes and Supporting Evidence from Data Sources

Theme	Evidence from Observations	Evidence from Surveys
Emergent Literacy Development	Children used sticks to write, narrated stories with nature props, labeled objects	Teachers reported increases in vocabulary and oral language outdoors
Teachers as Facilitators	Teachers asked open-ended questions, guided vocabulary, modeled emotional language	Described roles as guides, noted more engagement through facilitation
Social-Emotional Growth	Children created 'sad spot', offered peer support, collaborated on problem-solving	Highlighted fewer behavior issues, noted emotional regulation and collaboration
Outdoor Classrooms as Equalizers	Students with IEPs led activities, showed increased participation and voice	Reported that labels were less relevant, students engaged equally
Teacher Autonomy	Teachers embedded standards using natural materials, discovered instructional value	Felt empowered despite no formal training, requested PD in outdoor methods
Environmental Awareness and Scientific Inquiry	Children described duck feather insulation; created a "wet bed" for a worm; asked scientific questions and labeled parts in nature journals.	Teachers reported spontaneous writing and labeling triggered by nature-based observations; noted strong engagement when students asked scientific questions and shared ideas with peers.

6.1. Emergent literacy development

Children consistently demonstrated authentic literacy behaviors within the outdoor environment. One morning, a student picked up a stick and began pretending it was a pencil. He knelt in the dirt and began

writing letters, backwards and uneven, but with confidence and ownership of his work. Nearby, another child narrated a story about worms escaping from a 'storm' made of leaves. She organized her peers into roles and paused to explain the plot, effectively orchestrating a collaborative storytelling experience. These spontaneous activities reflected deep engagement with early literacy practices, including oral storytelling, sequencing, and emergent writing, all without the use of paper, worksheets, or whiteboards.

Across multiple sessions, children regularly labeled natural objects, recognized environmental print, and used descriptive language to narrate their observations and experiences. Nature-based props like sticks, stones, and leaves became characters, writing tools, or story settings, blurring the line between play and purposeful literacy development. Teachers noted that students, particularly those who were quieter indoors, demonstrated increased vocabulary, stronger oral language, and more confidence in their verbal expression when learning in the outdoor classroom.

These findings suggest that literacy is not confined to structured indoor lessons. The outdoor classroom created an ideal environment for fostering early literacy through embodied, exploratory experiences.

6.2. Teachers as facilitators

While many educators enter outdoor learning environments with limited formal training, this study found that teachers quickly adapted and embraced the pedagogical possibilities of outdoor instruction. The data revealed that teachers initially questioned whether literacy learning could meaningfully occur in unstructured, nontraditional settings. However, as the study progressed, they began to recognize the instructional richness and interdisciplinary value embedded in outdoor classrooms.

One teacher candidly shared at the beginning of the study, "I wasn't sure this counted as real teaching." Like many educators, she was used to equating high-quality instruction with High Quality Instructional Materials (HQIM), structured literacy blocks, and traditional classroom rules. But her experience in the outdoor classroom shifted that perspective. During one observation, she facilitated a small group activity where students used sticks to form letters, sorted leaves by color and count, and built word families out of rocks. Each task was deeply rooted in core academic standards: phonemic awareness, vocabulary development, and math concepts, yet framed through play and exploration.

Later, in her survey response, the same teacher reflected, "I realized I was hitting more standards out

here than I sometimes do inside.” Her tone had changed. By the end of the study, she reported seeing the outdoor classroom not as free time or a break, but as a legitimate instructional space that supported literacy, science, social-emotional learning, and student engagement in integrated and authentic ways.

This transformation was echoed across teacher reflections. Despite minimal formal preparation, educators reported growing confidence in their ability to meet standards in outdoor settings. They cited the natural integration of content areas, the flexibility of student-led inquiry, and the enhanced motivation and focus of their students. At the same time, teachers expressed a desire for professional development to help them design intentional, standards-aligned outdoor lessons and better understand how to assess learning in nature-based contexts.

These findings suggest that, beyond encouragement and reflective practice, early childhood educators were motivated by a renewed sense of professional autonomy and joy in teaching, allowing them to intuitively embed high-quality instruction into outdoor learning. Furthermore, the experience of teaching outdoors appeared to reinvigorate professional identity, allowing teachers to experiment, observe student growth in new ways, and reconnect with the joy of teaching. As one participant summarized, “This is what learning is supposed to feel like, for them and for me.”

6.3. Social and emotional growth

One of the most profound themes to emerge from this study was the significant development of students’ social and emotional skills in the outdoor classroom. Unlike the more structured indoor environment, the outdoor space allowed children to engage in flexible, student-led interactions that fostered empathy, cooperation, and emotional regulation. Across multiple observations, students were seen resolving conflicts independently, collaborating in imaginative play, and offering one another emotional support without adult prompting.

A particularly compelling example of this occurred when a child, emotionally overwhelmed during outdoor play, quietly walked to the edge of the wooded area and sat alone beneath a tree. There was no disruption, no teacher intervention, and no meltdown, just space. A few moments later, another child walked over, looked at the observer, and calmly explained, “That’s the sad spot. We go there when we’re sad.” What was most striking about this moment was that the “sad spot” was not a designated or teacher-created location; it was entirely child-initiated. Over time, researchers observed that when students became upset or emotionally

dysregulated, they often gravitated toward this space, giving themselves time to self-regulate. Eventually, a peer would come over, gently invite them back, and re-initiate play.

This routine, unwritten, unspoken, yet deeply respected by the children, reflected advanced emotional awareness and self-regulation that is typically seen as needing explicit instruction in early childhood settings. Instead, the open, natural environment seemed to activate these capacities in intuitive ways. Students gave each other both space and grace, demonstrating emotional intelligence often not seen in kindergarten.

Teachers corroborated these observations in their survey responses, reporting that students interacted more collaboratively outdoors, managed social tensions more peacefully, and exhibited stronger emotional independence. They also noted that some students who struggled with behavior indoors were noticeably calmer and more emotionally regulated in the outdoor space.

These findings suggest that the outdoor classroom not only supported academic learning but also created conditions for essential social and emotional development. Within Wonderland Woods, children were able to develop and practice emotional skills such as empathy, self-regulation, and compassionate peer interactions—skills that are foundational to lifelong learning and well-being.

6.4. Outdoor classrooms as equalizers

Another significant theme that emerged from this study was the way outdoor classrooms fostered equity, inclusion, and visibility for students who often struggled to find their voice in traditional learning spaces. Teachers and researchers observed a consistent pattern: students with individualized education programs (IEPs), speech-language delays, or behavioral labels frequently flourished outdoors—not just participating, but often leading.

One particularly powerful example involved a kindergarten student diagnosed with autism who rarely spoke during indoor lessons. Typically quiet and withdrawn in structured classroom settings, his participation was minimal and his communication sparse. Yet outside, during unstructured playtime, a transformation occurred. During one observation, the student began collecting leaves, rocks, and sticks and arranged them meticulously into what he described as a “museum exhibit.” With no prompting from adults, he gathered several of his classmates and proceeded to give a full tour, explaining each item in vivid detail, using content-specific vocabulary, and even fielding questions from peers.

For many of the children and adults, it was the first

time they had heard him speak at length. His teacher later reflected, “Out here, he’s not the quiet kid. He’s the expert.” This moment was not an isolated incident. Across the study, students with learning differences demonstrated greater confidence, creativity, and communication in the outdoor classroom. Teachers noted that the natural environment removed the rigid structures and visible hierarchies often present indoors. Without desks, grading charts, or assigned seats, all students had access to learning experiences on their own terms. The fluid and open-ended nature of outdoor play allowed children to initiate activities, collaborate based on interest rather than ability, and engage without fear of being wrong or evaluated.

In many ways, the outdoor classroom functioned as an equalizing space, a learning environment where traditional labels and roles lost their power, and every child had an opportunity to lead, to express themselves, and to contribute meaningfully. These findings align with inclusive education literature that emphasizes the need for environments that are both physically and emotionally accessible [13]. By removing the barriers that often limit participation indoors, the outdoor classroom created conditions that supported strength-based engagement, especially for students who are typically marginalized by traditional pedagogies. These outcomes suggest that nature-based learning is not only developmentally appropriate but also inherently inclusive, making it a valuable strategy for supporting diverse learners in early childhood education.

6.5. Teacher autonomy

One of the most consistent and compelling findings from this study was the way teachers adapted their instructional roles in the outdoor classroom. Rather than serving as the sole providers of information, teachers became responsive facilitators—guiding inquiry, modeling language, and creating the conditions for literacy to emerge organically through play and exploration.

During one observation, a group of students was constructing a “restaurant” out of rocks and leaves. Rather than directing their activity, the teacher knelt beside them and simply asked, “What’s on your menu today?” That single, open-ended question initiated more than ten minutes of sustained, literacy-rich play. The children negotiated roles, described ingredients, debated how to spell “taco,” and invented a backstory for their outdoor eatery. The teacher’s presence was subtle yet powerful. She entered the play without taking it over, allowing language, storytelling, and collaboration to unfold naturally.

Across the study, teachers were frequently observed

modeling vocabulary, prompting discussions, and scaffolding students thinking through carefully chosen questions or terms. For example, when a student observed a substance oozing from a tree and asked about its cause, the teacher initially looked it up on her phone and introduced the term “tannins” to explain the phenomenon. After further investigation, she refined her understanding, recognizing that internal tannins were contributing to the reaction rather than surface-level changes. This episode exemplifies how outdoor learning environments can prompt authentic moments of professional learning, allowing teachers to model curiosity, engage in just-in-time research, and deepen their content knowledge in response to student-driven inquiry. In another case, a teacher helped a child navigate a social conflict over a leaf pile by coaching them to say, “I don’t like that,” reinforcing both emotional literacy and expressive language.

Survey responses supported these observations, with teachers expressing appreciation for the way outdoor learning allowed them to teach with flexibility, responsiveness, and creativity. Several noted that their instructional goals, particularly in vocabulary development and oral language, were more easily met outside, where children were naturally curious and highly engaged. Rather than managing behavior or delivering content in a structured format, teachers guided discovery, coached through conflict, and amplified student voice through meaningful interaction. These findings align with sociocultural theories of learning, particularly Vygotsky’s concept of the zone of proximal development, in which learners construct knowledge through interaction with more knowledgeable others in rich contexts. Like Kiewra and Veselack [9], our study found that in the outdoor classroom, the teacher’s role was not diminished, but reframed: from content expert to co-creator of meaning, attuned to the linguistic and emotional opportunities that nature-based learning provides.

6.6. Environmental awareness and scientific inquiry

Curiosity about the natural world was a common driver of student engagement. Children frequently asked questions about animals, insects, plants, and weather patterns. These questions often led to storytelling, labeling exercises, and nature journaling. For example, during one observation, a child noticed the feathers of a bird and explained to peers, “They stay dry because they have a water coat.” This comment sparked a group conversation about how animals stay warm in winter, which led to a comparison of fur and feathers, initiated entirely by the students.

In another instance, a child discovered a worm on the dry sidewalk and created a “wet bed” for it, carefully layering damp leaves and sticks to rescue it. A classmate joined and asked, “Will it breathe better now?” a question that prompted both children to orally label its body parts like “head” and “tail.”

Teachers observed that outdoor environments often led students to make spontaneous scientific inquiries and then translate those inquiries into expressive language, drawing, labeling, or collaborative storytelling. One teacher wrote in her survey, “I didn’t need to ask for writing; they were already writing and drawing to explain what they were seeing.”

These moments support constructivist theories of learning and mirror the ideas of Montessori and Malaguzzi, who emphasized the role of the environment as an active agent in learning [17], [18]. They also reflect Warden’s [19], vision of the outdoor classroom as an interdisciplinary space where science, literacy, and social-emotional development intersect. In this way, nature functioned as a co-teacher, offering authentic problems for children to investigate through observation, hypothesis-building, and expressive language use.

Ultimately, the study highlights a critical need for schools and teacher preparation programs to recognize and support the instructional value of outdoor classrooms, not just as enrichment but as a meaningful site for integrated, standards-based instruction.

7. Discussion

The findings of this study support and extend existing research on the value of outdoor learning environments in early childhood literacy development. Consistent with previous work by Miller [16], Rubin [7], and Kiewra and Veselack [9], our study confirms that natural settings foster authentic literacy behaviors: storytelling, labeling, and expressive language all through child-led exploration. However, the findings go beyond current literature by demonstrating how structured literacy standards can be met in outdoor contexts even in the absence of formal teacher training, particularly in under-resourced, Title I school settings.

7.1. Connecting to the literature

This study affirms the theoretical foundations laid by Montessori (1967/1995) and by the Reggio Emilia approach, as described by Edwards et al. [18], both of which emphasize the environment as an active participant in the learning process. The outdoor classroom, as evidenced in this study, acts not only as a backdrop for play but as a co-teacher, prompting

observation, questioning, narration, and meaning making. Students naturally engaged in multimodal literacy practices that align with contemporary definitions of literacy as social, contextual, and embodied.

7.2. Contributions to literacy and pedagogy

Importantly, the findings also suggest that emergent literacy behaviors, like oral storytelling, letter formation, and vocabulary development, occur organically when children are given the freedom to explore. The outdoor environment prompted spontaneous inquiry and language use that was often more sophisticated than what teachers observed indoors, underscoring the need to reconsider where and how foundational literacy experiences occur.

7.3. Future research

Future research could explore the scalability of outdoor classrooms in urban settings and additional grade levels to determine their viability across diverse school contexts. Longitudinal studies are needed to examine the long-term impact of early exposure to outdoor learning on literacy development and environmental attitudes. In addition, future work could assess the effectiveness of teacher training programs aimed at preparing educators to facilitate standards-based literacy instruction in outdoor environments.

7.4. Implications for educators

Teachers in this study initially expressed uncertainty about whether outdoor play “counted” as instructional time. However, as they facilitated student-led exploration and embedded phonics, vocabulary, and math into natural materials, they recognized the interdisciplinary potential of the outdoor space. By the end of the study, many teachers viewed the outdoor classroom as not only a legitimate instructional setting but a powerful one. This shift in perception suggests a need to reframe outdoor learning not as enrichment or downtime but as a valuable site for delivering standards-based content.

The role of the teacher also emerged as central, but different, in outdoor learning. Rather than delivering information, teachers served as facilitators of learning, using open-ended questions, modeling emotional regulation, and prompting vocabulary in real time. These responsive instructional moves aligned well with child-led inquiry frameworks and support broader pedagogical shifts toward constructivist, play-based literacy practices.

The findings of this study offer several practical implications for early childhood educators. Outdoor classrooms can be powerful tools for fostering literacy when educators are intentional in leveraging the natural environment. Teachers can use nature-based prompts to inspire storytelling, dialogue, and labeling activities, and should see the outdoor classroom as a natural venue for oral language development. Furthermore, educators can support social-emotional learning by using the flexibility of outdoor spaces to encourage empathy, self-regulation, and collaboration. Because outdoor classrooms foster inclusivity, they are particularly beneficial for students with diverse learning needs. Lastly, professional development is necessary to help teachers design and implement effective outdoor literacy lessons and to build confidence in facilitating learning in nontraditional settings.

Given the impact of the outdoor classroom on both literacy outcomes and teacher confidence, the study highlights an urgent need for professional development that equips educators to teach effectively in outdoor environments. None of the participating teachers had formal training in nature-based pedagogy, yet they demonstrated adaptability and creativity. With targeted professional development in areas such as outdoor safety, curriculum integration, and formative assessment in natural settings, teachers could maximize the literacy potential of outdoor spaces more intentionally.

In addition, school leaders might consider how outdoor learning aligns with school improvement goals and literacy initiatives. Rather than existing outside of core instruction, outdoor classrooms can be leveraged as extensions of the literacy block, particularly for students who struggle in traditional, screen-forward environments.

Students with learning differences, including those with IEPs or speech-language needs, were especially responsive to the outdoor setting. These students often took on leadership roles, engaged in more verbal expression, and interacted confidently with peers. Teachers noted that outdoors, labels “disappeared,” and student strengths became more visible. These findings underscore the inclusive nature of outdoor learning and suggest that it can serve as a natural differentiation tool for meeting diverse learning needs.

Teachers also experienced professional growth. Several reported renewed joy in teaching, increased confidence, and a deeper understanding of their students’ interests and abilities. These outcomes point to broader benefits of outdoor literacy beyond academic growth, namely, improved classroom relationships and teacher efficacy.

In the current educational climate, many early childhood classrooms are shaped by scripted HQIM programs and screen-based individualized learning tools. While these resources can support consistency and targeted skill development, they often lack opportunities for oral language, collaborative play, and imaginative exploration, elements that are essential for emergent literacy and social-emotional growth. This study highlights the importance of counterbalancing screen-centric instruction with sensory-rich, student-led literacy opportunities in natural environments. The outdoor classroom offers a vital complement to digital tools, allowing students to apply and extend their learning through real-world experiences. Rather than viewing outdoor instruction as separate from technology integration, schools should explore hybrid models that blend the best of both approaches, leveraging digital platforms for assessment and fluency practice while using outdoor spaces to cultivate inquiry, storytelling, and multimodal literacy.

8. Conclusion and Future Research

Outdoor classrooms provide a dynamic and engaging environment that supports early literacy development, fosters social-emotional growth, and cultivates environmental awareness. By integrating outdoor learning into early childhood education, educators can create meaningful, hands-on experiences that enhance student engagement while aligning with academic objectives. As schools continue to prioritize holistic and inclusive instructional methods, outdoor classrooms offer a balanced approach that not only reinforces literacy skills but also nurtures collaboration, critical thinking, and a deeper connection with the natural world.

Our study challenges the assumption that early literacy development must take place in traditional, indoor, print-rich environments. It offers support that literacy can be embedded in play, exploration, and natural contexts, broadening what counts as legitimate literacy instruction.

We often conceptualize literacy as something that unfolds within the boundaries of desks, paper, and pencils—quiet, controlled, and measurable. However, the findings of this study suggest otherwise. Literacy, especially in early childhood, can just as powerfully take shape in muddy hands, in a child rescuing a worm, or in the spontaneous creation of a story beneath a tree. Nature items become authentic literacy tools for fostering early literacy skills.

In the outdoor classroom, every child has the potential to become a storyteller. A patch of grass

transforms into a rich canvas for language, and the role of the teacher shifts, from deliverer of content to facilitator of learning. In an era when schools are increasingly shaped by standardized testing and scripted curricula, the outdoor classroom offers a reminder of what we have long known: children learn best when they are curious, when they feel connected, and when they are given the freedom to explore. Perhaps the most powerful literacy tool we have is not housed within the classroom walls, but just outside the door.

9. References

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