

The Role of Nature Play in Supporting Students with ADHD According to Biblical Principles

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ABSTRACT

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As inclusive education expands, Christian schools are tasked with developing holistic pedagogies for students with ADHD. This research investigates nature play as a developmentally appropriate and theologically grounded approach. Framed by the Pyramid of Learning, which positions sensory integration as foundational to higher-order skills, the study explores how sensory-rich outdoor environments support children with ADHD in a Christian school setting. Using qualitative methods, including observation and teacher interviews, the research identifies how nature play fosters emotional regulation, sustained attention, and social interaction in these students. Furthermore, this practice aligns with core Christian values, embodying stewardship of creation and compassion, and affirming each child's identity as an image-bearer of God (Imago Dei). This study presents a model that synthesizes developmental theory and Christian pedagogy, demonstrating how faith-based schools can implement evidence-informed, spiritually coherent strategies. It highlights the potential of faith-based educational settings to implement evidence-informed, spiritually coherent strategies that support the holistic development of neurodiverse learners. In particular, this study will contribute to the existing literature on the implementation of inclusive education in Christian schools.

INTRODUCTION

In recent years, awareness of inclusive education has been growing widely (Lindert et al., 2023), seeking to integrate children with special needs into mainstream classrooms, affirming education as a fundamental need for all people (Shutaleva et al., 2023). This paradigm shift responds to the principle of creating environments where every child is valued as an individual who can participate (Donath et al., 2023), thrive academically, and maintain their well-being. However, many educational institutions struggle to provide the support (Arnaiz-Sánchez et al., 2023), specialized tools (Navas-Bonilla et al., 2025), and trained teachers (Mykyteichuk et al., 2022) needed to effectively facilitate the holistic development of children with diverse needs. Beyond academic instruction, these children, particularly those with neurodevelopmental conditions such as Attention-Deficit/ Hyperactivity Disorder (ADHD), require opportunities for sensory engagement, social interaction, and emotional regulation (Saragih & Azizah, 2025) to prepare meaningfully for participation in society.

Unfortunately, such needs often go unmet, leading to children being isolated, which hinders their development (Desterro et al., 2025). This gap is especially pronounced when considering therapy and educational resources. Access to specialized interventions such as speech or occupational therapy remains limited, particularly in remote regions, leaving families and educators to navigate these challenges with inadequate support (Zendarski et al., 2022). Even in urban settings, awareness of the importance of structured, sensory-rich experiences beyond conventional classrooms remains limited (Finnigan, 2024). For children with ADHD, characterized by symptoms of inattention, hyperactivity, and impulsivity, such experiential learning is not merely beneficial but essential for developing their cognitive, social, emotional, and motor skills (Helmer et al., 2024). Emerging research highlights nature-based learning as a profoundly effective approach for supporting children with special needs (Morrison, 2022; Natalini & Savastano, 2024). Immersive, sensory-rich outdoor environments offer calming, inclusive spaces that stimulate curiosity (Jørgensen et al., 2025), reduce stress (Ferrentino et al., 2024), and promote emotional regulation (Mason et al., 2022). These natural settings provide a therapeutic environment where children can engage

directly with their surroundings, fostering independence and holistic growth (Koh, 2025). This aligns with a theological understanding of nature as integral to human flourishing (Beeley, 2016). Because nature provides an unstructured environment, it becomes a way for children with special needs to discover their potential, as gifted by God. Potentials that could be unlocked outside the classroom settings, and help them find their identity as God's image-bearers through a variety of activities that support their holistic development.

Biblical scriptures, such as Genesis 1–2, portray nature as part of God's intentional design for humanity's well-being, a space for humankind to dwell, work, and thrive. Within a Christian framework, nature is seen not only as a resource but also as a sacred instrument that supports the development of each child, affirming each child's identity as created in the image of God (Imago Dei) and fearfully and wonderfully made.

While existing studies have begun to explore the effect of nature on children's behavior, particularly among children with ADHD (Damasceno et al, 2022), most have been conducted in Western contexts, often through systematic reviews rather than qualitative research. There remains a gap in research on educational settings that intentionally integrate nature play with a Christian theology approach. Many studies that used nature only focus on nature as a home-based intervention (Armitt et al., 2025) and a humanistic approach (Harper et al, 2025).

This study addresses that gap by examining the role of nature play at a Christian school in Australia. A setting that combines a dedicated outdoor learning environment with a biblically grounded commitment to inclusive, holistic education. The school supports children with special needs through tailored programs. It offers meaningful context for exploring how nature play functions as both a therapeutic tool and a means of spiritual, emotional, cognitive, and physical development. Specifically, this research seeks to answer: What kind of nature play environment is used to support children with special needs? And how does nature play support students with ADHD in alignment with biblical principles?

By investigating these questions, this study aims to contribute theoretically to the field of special education by integrating developmental and theological perspectives and, practically, to equip educators with actionable insights for These nature-based learning experiences honor the unique design and potential of every child.

Nature Play

Play is widely recognized as a fundamental step for child development. Scholars such as Piaget (1951) and Fröbel (1967) have long argued that play is the primary way through which children actively explore, understand, and express their world, constituting a spontaneous expression of thought and feeling. Modern perspectives from organizations such as UNICEF (2018) and scholars such as Jordan (2022) reaffirm that play is not merely a leisure activity but a critical, foundational context for acquiring essential knowledge, skills, and social competencies.

In parallel, natural environments provide the ideal dynamic stage for this developmental process. Nature, defined as the totality of living and non-living elements and processes that exist independently of human influence, offers more than just resources; it offers a diverse and stimulating playscape (WHO, 2023). As noted by Fjørtoft et al. (2021), such as slopes and rocks, offer a natural playscape that encourages children to adapt and problem-solve, while plants like trees and bushes provide opportunities for climbing and shelter, and open meadows facilitate activities like running and tumbling.

Therefore, nature play, defined as unstructured, open-ended play within natural settings or with natural materials, emerges as a vital synthesis of these two concepts. It is characterized by sensory immersion, freedom, and child-led exploration (Harte et al., 2022; Kuswanto et al., 2024). Activities like jumping in puddles, building with sticks, or digging in soil engage children holistically, fostering not only physical and cognitive growth but also emotional well-being and a sense of connection to the environment. As Kinsner (2019) emphasizes, integrating such outdoor play into daily routines supports comprehensive early learning across all developmental domains.

Based on research, nature play uses the natural environment as a sensory-rich classroom that supports children's holistic development. By prioritizing sensory and perceptual experiences through play, this approach aligns with the Pyramid of Learning and provides a strong foundation for academic achievement. It also reflects the belief that nature is a powerful and adaptive tool for fostering creativity, curiosity, and building them as a lifelong learner.

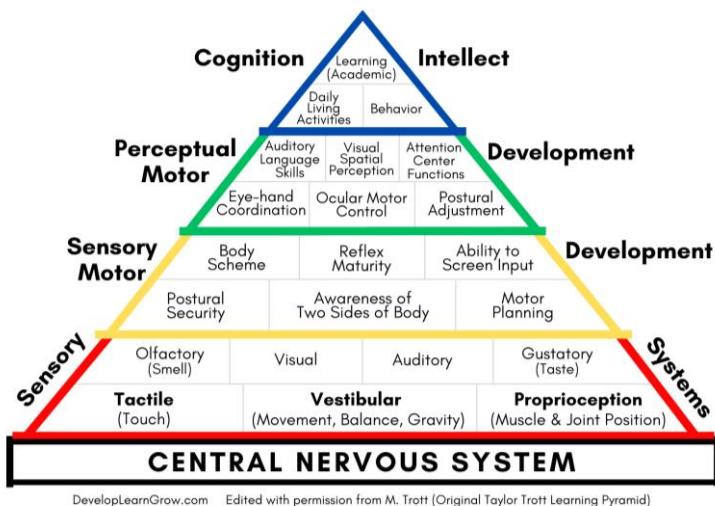


Figure 1. Pyramid of learning

Special Education

Special education is an educational approach that provides supplementary support and adapted instructional methods, enabling individuals with diverse needs to participate fully and achieve learning objectives within educational programs (UNESCO, 2011). Its core mission is to empower learners by individualized instructions, curriculum, and support services to align with their unique strengths and challenges, thereby fostering holistic development across academic, social, and emotional domains (Zai et al., 2020). This approach is distinguished by its individualized, explicit, systematic, and intensive nature, often involving smaller group instruction and heightened levels of corrective feedback and reinforcement (Hallahan et.al, 2020) Guided by principles such as zero-rejection policies and individualized education programs (IEPs), special education policy ensures equitable access to free and appropriate public education for students with disabilities (Siahaan, 2022).

Attention-Deficit/Hyperactivity Disorder

Attention-Deficit/Hyperactivity Disorder (ADHD) is a clinically diverse neurodevelopmental syndrome primarily characterized by enduring patterns of inattention and/or hyperactivity-impulsivity that interfere with functioning or development (APA, 2022; Mahrous et al., 2024). It is understood not merely as a behavioral disorder but as a condition rooted in challenges with self-control and executive function, the cognitive processes that manage goal-directed behavior (Barkley, 2020).

The American Psychiatric Association (2022) categorizes ADHD into three presentations. First, predominantly inattentive presentation: characterized by persistent difficulties in sustaining attention, organizing tasks, following detailed instructions, and a tendency to be easily distracted and forgetful in daily activities. Second, predominantly hyperactive-impulsive presentation: marked by excessive motor activity (fidgeting, leaving seats), an internal sense of restlessness ("driven by a motor"), impulsive actions like interrupting others, and difficulty engaging in quiet activities. Lastly, combined presentation: exhibits significant symptoms from both the inattentive and hyperactive-impulsive domains.

Notably, ADHD is categorized under "Other Health Impaired," reflecting its broader impact on multiple life domains beyond specific academic skills (Learning Disabilities Association of America). It is a pervasive condition that affects behavioral, emotional, educational, and cognitive functioning throughout the year (Lougy et al., 2007).

Challenges Faced by Students with ADHD

The challenges faced with ADHD extend beyond a simple difficulty in paying attention. Instead, they represent a complex constellation of functional impairments that affect the child's daily life. According to Jensen (2009), these challenges are best understood across three interconnected domains. Firstly, children often experience significant difficulties with cognitive and executive functioning, including tasks involving working memory, planning, organization, and filtering distractions. Secondly, they face profound behavioral

and self-regulatory hurdles, characterized by impulsivity, hyperactivity, and a lack of self-awareness that prevents them from effectively monitoring their own thoughts and actions (Barkley, 2020). These internal dysregulations lead to the third domain: emotional and social challenges, where poor frustration tolerance, emotional volatility, and impulsive social responses can hinder peer relationships.

At the heart of these challenges lie core vulnerabilities in attention regulation, distractibility, and an intrinsically variable attention span that make sustained focus nearly impossible on tasks that are not inherently stimulating or motivating (Maté, 2023). As a result, children with ADHD frequently appear to function on "automatic pilot," unable to consistently marshal the executive functions required for concentration, forethought, and self-control that come more naturally to their peers (Wolraich and Hagan Jr, 2019). This pervasive impact on learning, behavior, and social-emotional well-being highlights the critical need for the specialized, supportive frameworks inherent to effective special education, which are designed to scaffold these very skills and facilitate holistic development.

Biblical Perspective

A foundational theological concept for understanding human identity and purpose is the perspective of *Imago Dei*, or "image of God," derived from the creation narrative. Christian education bases the concept of who humans are on the essential doctrine of God's Word, where humans are created in the image and likeness of God, known as *Imago Dei* (Genesis 1:26-27). The key text, Genesis 1:27, states: "So God created mankind in his own image, in the image of God he created them." Humans were created perfectly, without flaw or blemish, toward God, others, and creation. Humans reflect God as agents responsible to God, the Creator and Ruler. Humans also have God's characteristics, enabling them to think, create, and learn in this world (Peterson, 2012).

This concept, expressed with the Hebrew word *tselem*, signifies humanity's unique distinction and capacity for reason and responsibility, setting them apart within creation (Suparti & Daliman, 2023). Crucially, the *Imago Dei* is inherent in every person, irrespective of ability, and affirms the intrinsic dignity and worth of all individuals (Maliszewska, 2019). Nancy Pearcey once conveyed an idea that connects the above concept with education, namely that Creation shows that humans are created in the image and likeness of God, which means we are given dignity as creatures who have the capacity to love, have moral and rational, creative capacities with artistic taste, and all other unique capacities (Pearcey, 2004).

This identity directly informs humanity's purpose, articulated in the accompanying Cultural Mandate (Genesis 1:26-28). As God's image-bearers, humans were entrusted with the authority to steward and care for creation—to "subdue" and have "dominion" not for exploitation, but for cultivation and restoration, reflecting God's own character as a wise ruler (Genesis 2:15). This mandate involves the responsibility to develop culture, manage resources, and promote flourishing for all creation (Hapsarini & Pige, 2021). Together, the *Imago Dei* and the Cultural Mandate provide a holistic theological framework that grounds human dignity in divine likeness and directs that dignity toward purposeful, creative, and restorative work in the world.

This understanding helps the educator see students with ADHD who need more exposure to physical movement, sensory engagement, and environmental responsiveness. Using nature play through the lens of creation and *imago Dei* becomes more than a teaching strategy. It is grounded in the theological teaching of the embodied nature of human learning (Smith, 2013; Wolters, 2005). When students are engaged with nature, they experience God's good creation directly, supporting their attention, self-regulation, and holistic development in ways consistent with their created design (Taylor & Kuo, 2009). This educational practice can be understood as participating in God's original intention for human flourishing within His created order (Wolters, 2005).

METHODOLOGY

The study utilized a descriptive qualitative method to explore how nature play supports students with ADHD through a Biblical lens. Guided by two central research questions, data were collected over a three-month period from late July to mid-October 2025. This included in-depth interviews with two key staff members: an Early Learning Centre teacher and a Diverse Learning specialist at a Christian school in Australia. Field observations were conducted both during and after school hours to examine the nature-play environment and student engagement, and were supplemented by a review of school documents. Following data collection, the researcher analyzed interview transcripts, field notes, and documents through a process

of condensation, thematic identification, and conclusion drawing. To enhance validity, triangulation was applied by cross-verifying findings across multiple sources and methods. The results presented are derived from this analytical process.

RESULTS

Nature Play Supports Holistic Development

Nature play utilizes the natural environment as a multi-sensory, dynamic classroom that actively supports the holistic development of children. Both informants in this study affirmed that engagement with nature is particularly beneficial for holistic growth. This is especially critical in the context of students with ADHD, who often require tailored support within traditional learning environments. As K emphasized, these children "need these experiences for proprioceptive development, social skills, problem-solving, regulation, burning energy, and helping them concentrate." Through analysis of the interview data, this research identified five key elements of a nature play environment that are essential for supporting the developmental needs of students with ADHD.

The Elements of Nature Play

The first element identified is a dedicated space for physical activities, serving a dual purpose: regulating energy and supporting gross motor development. Informants emphasized its critical role for students with ADHD. K explained that proprioceptive tasks like "heavy lifting" are intrinsically regulating: "If they are lifting bits of wood... it helps them feel calm" (K, personal communication, September 24, 2025). R detailed how the environment facilitates this, highlighting specific zones such as the "bike track" and grassy areas for "obstacle courses," as well as features such as logs and rocks for climbing, which develop physical skills (R, personal communication, August 15, 2025). Observational data confirmed this principle. A child with ADHD, during a one-hour observation, engaged in major motor activities (running, climbing, digging) for approximately 90% of the session. This demonstrated a clear drive for sensory-motor engagement, which proved essential for self-regulation and transitioning to focused, communal activities. Thus, the physical design functions not merely as a play area but as a fundamental therapeutic tool for fostering self-regulation and physical competence.

The second element encompasses experiences designed to foster cognitive growth through problem-solving and inquiry. The environment provides open-ended resources that necessitate active learning; for example, building shelters with branches involves inherent "problem-solving" (K, personal communication, September 24, 2025). Educators cultivate this by actively fostering "curiosity" as a core learning objective, creating a space where "rich learning happens... where the kids show their agency, follow their own interests, experiment, and test their own hypotheses" (R, personal communication, August 15, 2025). Interactions with natural processes, such as using a "water pump, which encourages cause and effect," teach fundamental concepts directly (R, personal communication, August 15, 2025). This child-led, experimental approach promotes executive functions like planning and metacognition, as children are prompted to revisit ideas: "Getting them to think, 'Oh, last time we did this, do you want to try this again or try something new this time?'" (R, personal communication, August 15, 2025). This cognitive engagement is integrally linked to safe risk-taking, where children "learn their limits" through comfortable challenges, thereby developing self-monitoring skills (K, personal communication, September 24, 2025).

The third element involves intentionally designing the environment to provide a spectrum of sensory inputs, which is particularly supportive for students with ADHD. To address core symptoms, such as inattentiveness, the space is structured to meet diverse sensory needs. It offers calming retreats, such as "a nice space for them to hide away," and opportunities for focused visual stimulation with "natural resources like bugs, insects, and plants for them to look at" (R, personal communication, August 15, 2025). It also incorporates dynamic vestibular challenges through equipment "where they can get up high and things where they can move, like wobbly bridges or rope swings" (K, personal communication, September 24, 2025). The design accommodates individual preferences, with K noting that "some kids will go to the wet area and play with water if that helps them" (K, personal communication, September 24, 2025).

Direct observation and educator testimony confirm the therapeutic efficacy of this sensory-rich design. An observation documented a student with ADHD becoming deeply immersed in a sensory activity for an extended period, resulting in visible calm. R corroborated this, stating sensory play leads to an "increased attention span" and is "the type of activity that allows them to see and focus for a long time" (R, personal

communication, August 15, 2025). Therefore, this strategic sensory integration functions as a critical tool for improving concentration and self-regulation by aligning the environment with the children's unique sensory profiles.

The fourth essential element involves the deliberate design of spaces that facilitate and support social interaction, enabling children to organically practice navigating social situations. The environment includes structured zones, such as a central gathering circle, which provides children with the "opportunity to play by themselves or with their peers" (R, personal communication, August 15, 2025). These areas foster valuable peer-led socialization and, as K emphasized, offer a crucial "opportunity to practice their leadership skills" (K, personal communication, September 24, 2025).

This social learning is most profound within unstructured, imaginative play. K observed children in "hidey spots playing mums and dads," describing it as foundational experiential learning where they "experiment, role-play, and feel safe with friends" to understand social norms and "safely make mistakes" (K, personal communication, September 24, 2025). For students with ADHD, such dramatic play is particularly impactful, providing a low-pressure medium for grasping abstract social rules. An observation documented educators successfully using a puppet-based "social story" to explain safety boundaries to a child with ADHD, making the concepts more tangible than a verbal instruction alone.

Consequently, the integration of open communal spaces and secluded niches creates a vital social architecture. This design supports the experiential learning of cooperation, social norms, leadership, and safety, which is essential for the holistic development of all children, particularly those with ADHD.

The fifth and most fundamental element is the overarching philosophy of an unstructured, child-led environment. This principle underpins all others, creating the open-ended conditions necessary for exploration and self-directed learning. The environment is strategically designed to create a balance between stability and novelty. Routine provides a secure foundation, with familiar materials like sand and water always accessible, offering "familiarity and routine" (R, personal communication, August 15, 2025). Educators then scaffold learning by introducing new elements such as "pipes, bamboo, or animals to add variety and extend their play" (R, personal communication, August 15, 2025). Guaranteed, "daily" access to this outdoor space ensures children can rely on its availability to pursue their interests (R, personal communication, August 15, 2025).

Within this reliable structure, children experience true autonomy. They "enjoy exploring and having that freedom" in an intentionally unstructured setting that allows them to "follow what interests them more" (R, personal communication, August 15, 2025). This aligns with K's view that "nature play should be universal; you take from it what you need," necessitating a design that "encompasses as many different activities as possible" (K, personal communication, September 24, 2025). Consequently, the educator's role transforms from director to facilitator and observer, focusing on "what helps them and providing more of that" to ensure "each person has what they need to be successful" (K, personal communication, September 24, 2025). This approach proactively honors the child's innate drive to "play, take risks, learn about their bodies, and be explorers" and frames access to nature not as a reward but as a fundamental right (K, personal communication, September 24, 2025).

Observations confirmed this philosophy in practice. Educators engaged in a responsive cycle of observation and adaptation, using insights from children's interactions to introduce new materials or experiences approximately every two weeks. This process ensures the environment dynamically aligns with each child's evolving interests and needs, making the child-led philosophy the active, operational core of the nature play practice.

Impact of Nature Play in Supporting Students with ADHD

The analysis of the five key environmental elements reveals a consistent pattern of positive developmental impact for students with ADHD, fundamentally addressing the core challenges associated with the condition. These impacts are best understood across four interconnected domains: self-regulation, sociability, attention, and academic engagement. Furthermore, these developmental outcomes resonate powerfully within the study's Christian framework.

First, nature play provides a vital outlet for self-regulation and emotional management. As K explained, activities like bike riding that engage "heavy muscles" are inherently "regulating," helping a child become "calm" and able to converse. This is critical because, for a child whose ADHD is not well managed, "nature play allows them to get energy out... Afterwards, they can join in learning." Without this outlet, dysregulated energy often manifests as disruptive behavior, leading to negative social labels (K,

personal communication, September 24, 2025). The school operationalized this by allowing dysregulated students to negotiate access to the outdoor area, a practice sometimes recommended by Occupational Therapists to prime engagement (R, personal communication, August 15, 2025). Observations confirmed that children were consistently better at managing emotions and impulses following sustained nature play.

Second, the environment facilitates the authentic development of societal skills. The social architecture of the space, from communal circles to "hidey spots," creates natural contexts for practicing cooperation, negotiation, and leadership. K noted that when children channel energy into building or climbing, they "learn about sharing resources, negotiating, and problem-solving." This peer-led interaction shifts social perceptions: "How their peers view them changes, and how they view themselves changes" (K, personal communication, September 24, 2025). R observed this in action, describing a student whose construction project naturally drew in peers, creating a social context where he could "take on leadership and learn how to include them" (R, personal communication, August 15, 2025).

Third, contrary to stereotypes of distractibility, nature play cultivates a longer, deeper attention span. The sensory-rich, interest-led environment capitalizes on intrinsic motivation. R observed that "sensory stuff will usually hold their attention longer," and noted students were "incredibly engaged during nature play" when following their own agency (R, personal communication, August 15, 2025). This deep engagement in self-chosen, meaningful tasks directly counters the inattention that characterizes ADHD in traditional settings.

Finally, this renewed capacity for focus translates into greater readiness for formal academic engagement. K directly linked the regulatory function of nature play to cognitive readiness: "Cognitively, it improves because they can then attend to learning." R framed this as "incidental learning," where children explore numeracy and other concepts experientially. "It's about experiencing it and working it out for themselves," she stated, making the learning more meaningful and integrated than in forced, small-group settings (R, personal communication, August 15, 2025).

From a Christian perspective, the impact of nature play extends into spiritual and identity formation. The environment is seen as a direct revelation of God's character. Educators intentionally help children see God as the Creator, using simple, powerful statements such as, "How clever is God that he made that?" (R, personal communication, August 15, 2025). This helps children perceive God's power, creativity, and generous personality, framing joy and fun in play as gifts from God that facilitate learning.

Furthermore, nature play becomes a context for children to understand their identity and purpose. Through responsibilities like tending gardens or caring for the land, they begin to grasp the biblical concept of stewardship, understanding that "it's God's land first and foremost" and that we have a duty to look after it (R, personal communication, August 15, 2025). Crucially, the environment provides a space where children with ADHD can be successful, discovering their God-given potential. As K articulated, "When children engage in nature play, they learn who they are and what they are good at" (K, personal communication, September 24, 2025). This success in overcoming challenges fosters a sense of being "capable," helping them develop toward the unique potential God has created in them, which they might not discover in a conventional classroom setting. Thus, nature play aligns with a theology that views joy, embodied learning, and stewardship as integral to human flourishing, offering children with ADHD a path to see themselves as valued image-bearers capable of growth and contribution.

CONCLUSIONS

In conclusion, this research affirms that nature play is profoundly effective in supporting the needs of children with ADHD, a finding that resonates deeply with Biblical principles. The innate need for students to deliver their energy finds a harmonious outlet in the natural world, allowing them to steward their physical bodies and ultimately self-regulate to prepare for focused learning. Furthermore, within the context of God's creation, a testament to His character and glory, as stated in Romans 1:20, these children can engage in risk-taking and problem-solving that reveals their unique, God-given potentials. In this way, nature play becomes more than a therapeutic activity; it becomes a means of discovering one's identity as a beloved and skillfully crafted image-bearer, as celebrated in Psalm 139. It leads to success beyond the confines of a classical classroom. Thus, integrating nature play is not only an educational strategy but also a practical application of a worldview that values God's creation as a source of healing, revelation, and peace.

This research was primarily theoretical, conducted within a specific Western context. A critical next step is to apply these principles in a Christian school. Future research could explore the practicalities,

cultural acceptability, and efficacy of developing nature-based programs for children with special needs in a Christian context. Such a study could pioneer a transferable, sustainable, and culturally sensitive model for other developing nations, bringing the healing power of God's creation to more children around the world.

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