

## Qualitative Investigation of K-6 Administrators' Perceptions of Nature- Based Learning



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**ABSTRACT:** Although nature-based learning (NBL) contributes to the development of students, its inclusion in elementary schools is inconsistent. The purpose of this qualitative study was to explore elementary administrators' perspectives of and experiences with NBL, its support of elementary student development, and its inclusion in elementary schools' curricula and design. A basic qualitative design was used to capture the insights of 10 elementary administrators through semistructured interviews. Emergent themes were identified through open coding, and the findings were developed and checked for trustworthiness through member checking, rich descriptions, and researcher reflexivity. The findings revealed that NBL is supportive of child development and builds experiential learning but is not widely used.

**KEYWORDS:** nature-based learning, elementary, administrators, student learning, child development, nature

### I. INTRODUCTION

Despite NBL's demonstrated benefits to student development across grade levels, the inclusion of NBL within elementary schools' curricula and design is inconsistent across the United States (Sobel, 2019) <sup>[1]</sup>. Moreover, this lack of integration of nature within schools reflects a more general disconnection from nature experienced in current society both in public institutions and in private life (Louv, 2008) <sup>[2]</sup>. As a result, today's generation of children is detached from nature, spending the least amount of time outside compared to previous generations; specifically, only 4 to 7 minutes are spent each day on unstructured, outdoor play (Child Mind Institute, Inc., 2022) <sup>[3]</sup>. There is a growing divide not only between children and nature but between the known benefits of nature and the meshing of nature within school systems.

Louv (2008) <sup>[2]</sup> identified this trend as a nature-deficit disorder to describe the harm as the alienation from nature grows, especially amongst children. The harmful factors mirroring children's disconnection from nature include increased childhood obesity (Sanyaolu et al., 2019) <sup>[4]</sup>; increased youth anxiety, depression, and behavioral diagnoses (Lebrun-Harris et al., 2020) <sup>[5]</sup>; increased child technology use (Pew Research Center, 2022) <sup>[6]</sup>; increased asthma and attention deficit hyperactivity disorder medication prescribed to children (Hales et al., 2018) <sup>[7]</sup>; and an increased tendency to pack children's lives full of structured activities (Cision U.S. Inc., 2022) <sup>[8]</sup>.

Causes of this trend toward disconnection from nature are complex, but a major turning point in the home front appears to have been the missing children scare of the 1980's, a phenomenon that drastically and apparently permanently reduced children's freedom to independently explore and play in the outdoors (see Albritton; 2016 <sup>[9]</sup>; Greigo & Louis, 1985 <sup>[10]</sup>; Hysteria about missing children, 1986 <sup>[11]</sup>; Simpson, 2010 <sup>[12]</sup>). This effect has been exacerbated by changing American demographics, with the population shifting from rural areas to urban (see Johnson & Lichter, 2019) <sup>[13]</sup>. However, these factors do not completely explain changing preferences toward outdoor pursuits. Outdoor recreational activities for both children and adults, including summer camp attendance, hunting and fishing, and golf (pre-COVID) have all show precipitous declines in recent decades (Compton, 2020 <sup>[14]</sup>; Decline in hunting and fishing hurts stage coffers, 2008 <sup>[15]</sup>; Is summer camp dying?, 2015 <sup>[16]</sup>; Sellers, 2020 <sup>[17]</sup>).

One component of NBL involves dynamic engagement with nature, including unstructured play, independent exploration, and passive exposure (Chawla, 2021) <sup>[18]</sup>; however, the norm in schools is limited to offering structured learning activities confined to the indoor classroom setting. One way students access unstructured playtime and park-type settings is through recess during their school day (Voice of Play, 2022) <sup>[19]</sup>. Over the last 20 years, however, recess time has decreased by an average of 60 minutes per week, with 75% of school districts lacking a policy regarding recess time (Biccella, 2019) <sup>[20]</sup>. The average daily time at school recess is now only 26.9 minutes (Voice of Play, 2022) <sup>[19]</sup>. For comparison, U.S. law provides prison inmates with a minimum of 1 hour of outside recreation per day (Cornell Law School, 2022) <sup>[21]</sup>. It is widely accepted that school recess, like arts, music, field trips, shop class, and other enrichment activities, has been a victim of the accountability movement's emphasis on the three R's (reading, writing and arithmetic) (e.g., Gardner, 2015 <sup>[22]</sup>; Jeres, 2022 <sup>[23]</sup>; Rix, 2022 <sup>[24]</sup>). Moreover, there is emerge that outdoor

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exercise is more effective in promoting good health than is exercise conducted indoors (e.g., De Moraes et al., 2022<sup>[25]</sup>; Moslehi et al., 2019<sup>[26]</sup>; Noseworthy et al., 2023<sup>[27]</sup>).

Another component of NBL is outdoor education. Finding a public school with an outdoor-classroom setting is rare because approximately 80% to 85% of schools in the United States have no form of outdoor learning in place (Tate, 2020)<sup>[28]</sup>. Of the public schools with outdoor recreation areas, a minute percentage of those play areas involve nature, open spaces, and loose parts (Trust for Public Land, 2022)<sup>[29]</sup>. School grounds, especially school grounds in high-poverty areas, lack green spaces (Kweon et al., 2017)<sup>[30]</sup>. Instead, when examining a schoolyard today, chances are it will be composed of pavement, chain links, and artificial materials (Feldman, 2019)<sup>[31]</sup>. In Los Angeles Unified School District, 20% of schoolyards have 100% asphalt and zero trees (Moreno et al., 2015)<sup>[32]</sup>.

NBL establishes and fosters a responsible working relationship with the natural environment, and nature wholly benefits children when provided the opportunity (Chawla, 2015)<sup>[33]</sup>. However, the connection cannot be maintained if not established and nurtured. Students today cannot see or form the functional relationship available with nature because of the diminishing personal experiences children have with nature (Suttie, 2016)<sup>[34]</sup>. Formal relationships between public school systems and NBL organizations or initiatives are also limited. From 2012 to 2021, the number of Green Ribbon Schools in the United States, which are schools dedicated to sustainability practices and resources, decreased from 78 to 40 (U.S. Department of Education, 2021)<sup>[35]</sup>. In California, a mere 17 outdoor schools collaborate with local public-school districts and are certified by the California Outdoor Schools Association; these outdoor schools only serve fourth- through seventh-grade students (California Department of Education, 2022a)<sup>[36]</sup>.

If teachers want to implement NBL in the classroom, mandated instructional practices or curricula will likely hinder their desire. According to the U.S. Department of Education's National Teacher and Principal Survey, 71% of teachers explained they do not have autonomy over curriculum, content, topics, and skills taught in their classrooms (Economic Policy Institute, 2019)<sup>[37]</sup>. Indeed, Earth Day may be the occasion of the only explicit mention of the importance of nature within a child's public-school year (Rotas, 2019)<sup>[38]</sup>. These gaps are unfortunate, as NBL shifts students' relationships with nature from a singular lesson on recycling to an interconnected friendship and citizenship with nature, ultimately promoting student learning and health (Kuo et al., 2019)<sup>[39]</sup>.

In this study, we focused on elementary administrators' perspectives and experiences surrounding NBL, its support of elementary student development, and its inclusion in elementary schools' curricula and design. This topic is not yet sufficiently investigated or documented through research literature and requires further investigation (Jordan & Chawla, 2019)<sup>[40]</sup>. The subsequent sections of this study include identification of the research problem, description of the purpose, review of the research literature, discussion of methodology, presentation of data analysis and results, and drawing of conclusions.

## II. RESEARCH PROBLEM

Although NBL is a demonstrated contributor to the development of students in the elementary grades, inclusion in elementary schools' curricula and design is inconsistent, despite strong research evidence for the overall benefits of nature to student learning and child development (see Kuo & Jordan, 2019)<sup>[41]</sup>. In one example, Dale et al. (2020)<sup>[42]</sup> documented the benefits of nature on components of child development through various learning outcomes, focusing on upper elementary and middle school students. In another study, Harvey et al. (2020)<sup>[43]</sup> demonstrated NBL's positive, long-term mood and psychological influence on upper elementary children. Further, Schilhab (2021)<sup>[44]</sup> showed how NBL promoted content knowledge and cognitive development for children aged 7–16.

Additionally, researchers have established the benefits of nature to student learning and child development in the early childhood and elementary age groups. For example, Annisa and Sutapa (2019)<sup>[45]</sup> described the benefits of nature on the physical development domain of early childhood development and pointed out the need for more profound research on NBL with a focus on specific child development domains. The following year, Rymanowicz et al. (2020)<sup>[46]</sup> found that NBL positively affected early childhood students' language and conversation skills and discussed the need for further NBL research with the early childhood education population.

Elementary administrators, in their role as chief learning officers in their schools, are they key influencers of the pedagogical practices in their buildings (Grissom et al., 2021)<sup>[47]</sup>. However, there is a gap in the research literature regarding elementary administrators' perspectives of and experiences with NBL, its support of elementary student development, and its inclusion in elementary schools' curricula and design. A few studies have begun to address that gap. For instance, Burke et al. (2021)<sup>[48]</sup> focused on children's wellness from the school leaders' perspective and found that NBL provided a safe environment and fostered the development of motor skills and bodily health; however, the schools in their study were limited to two Canadian private schools. In another example, Harper et al. (2021)<sup>[49]</sup> conducted a case study to examine the experiences of teachers and administrators upon undergoing a schoolyard naturalization process at a Canadian elementary and middle school, but the research only focused on a single aspect of NBL, schoolyard naturalization.

In addition to a gap in research literature, there is a demand for such research on this topic. In particular, Frantzeskaki (2019)<sup>[50]</sup> pointed out the need to study nature-based solutions that are relevant, current, and descriptive of tangible actions to be realistic

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options for urban agendas and policy. Additionally, Miller et al. (2021) <sup>[51]</sup> recommended engaging with and seeking input from education stakeholders regarding NBL and school environments. Similarly, Jordan and Chawla (2019) <sup>[40]</sup> pointed out the need to involve school administrators in NBL research. Therefore, the specific research problem in the current study was that there is a gap in understanding of elementary administrators' perspectives of and experiences with NBL, its support of elementary student development, and its inclusion in elementary schools' curricula and design.

### III. PURPOSE STATEMENT

The purpose of this qualitative study was to explore elementary administrators' perspectives and experiences surrounding NBL, its support of elementary student development, and its inclusion in elementary schools' curricula and design. These stakeholders' initial ideas on the topic had not been documented or shared within research literature, including their ideas about and dialogue for the consistent implementation of NBL within U.S. public school systems. The perspectives and experiences of elementary school administrators, with and without NBL familiarity, shed light upon various aspects of consistent NBL implementation, including barriers, best practices, challenges, communication channels, and resources. The following research questions were developed to allow administrators to share opinions, reflections, lived benefits and challenges, logistics, and background information regarding the topic:

- RQ1: What are elementary administrators' perspectives of and experiences with NBL?
- RQ2: What are elementary administrators' perspectives of and experiences with how NBL supports student development?
- RQ3: What are elementary administrators' perspectives of and experiences with how NBL is included in curricula and design?

### IV. LITERATURE REVIEW

#### A. Conceptual Framework: Losee-Parts Theory and Domains of Child Development

We employed two theories to firm the conceptual framework: the loose-parts theory (see Nicolson, 1972) <sup>[52]</sup> and the domains of child development (National Association for the Education of Young Children, 2022) <sup>[53]</sup>. The loose-parts theory originated as the idea that children discover, invent, and derive satisfaction based upon their interaction, play, and creation with living things and worldly elements (Nicolson, 1972) <sup>[52]</sup>. NBL, too, finds its defining characteristics in natural elements, elements with innate variability, and loose parts (Gencer & Avci, 2017) <sup>[54]</sup>. We also grounded this study through the domains of child development outlined by the National Association for the Education of Young Children (2022) <sup>[53]</sup>: physical, cognitive, social-emotional, and linguistic development. The domains are not isolated areas in which children develop; instead, they are vitally interconnected (National Association for the Education of Young Children, 2022) <sup>[53]</sup>. Children may develop one domain at a time, multiple domains at a time, or all the domains at a time; overall, the relationship between the domains is essential. Furthermore, biological and environmental factors affect the domains of child development (National Association for the Education of Young Children, 2022) <sup>[53]</sup>.

#### B. History of NBL

Even in prehistorical times, NBL was an important part of child development. This point is important to remember because natural history can serve as a critical access point for a child to nature (Bates, 2018) <sup>[55]</sup>. Whether learning to survive, practicing natural navigation, or acquiring reading skills, NBL is simply a label for learning entwined with nature. In contemporary times, countries across the globe have employed and continued to use NBL through various practices and strategies for a spread of age groups and purposes.

Formal NBL practices emerged in the 1800s when industrialization led humans to the outdoor realm as an escape from their labours and early childhood education pioneers looked closely at how children learn (Dean, 2019) <sup>[56]</sup>. The 1950s marked the beginning of Sweden's formal use of outdoor education, and from there, Sweden and other countries began establishing dedicated forest schools (Maron-Puntarelli, 2020) <sup>[57]</sup>. By the 1960s, in Denmark specifically, the population realized the health and overall benefits of the natural environment; thus, NBL was normalized in the Danish school and childcare settings and became part of a defined movement through Denmark, Scandinavia, the United Kingdom, and North America (Dean, 2019) <sup>[56]</sup>. Now, in the United States, NBL is implemented in pockets of the country with inconsistency, this inconsistency being most marked in public schools (Sobel, 2019) <sup>[1]</sup>. The momentum of NBL dwindles as the early childhood spectrum extends into elementary school. Still, Americans value nature in relation to education. For example, components of NBL were key endeavours for human characters within award-winning and honoured picture books published from 1995 to 2020 in the United States (Shimek, 2021) <sup>[58]</sup>.

The COVID-19 pandemic created significant shifts in the education field, from mandatory school closures and distance learning to drops in public school enrollment (Dickson & Gray, 2022) <sup>[59]</sup>. Post-COVID-19 pandemic, contemporary education requires a nature-rich environment, a shift in ideologies and practices to ensure students' well-being, development, education sustainability, and democratized access to nature for all (Dickson & Gray, 2022) <sup>[59]</sup>. This change is especially true when knowing the COVID-19 pandemic compromised children's connection and involvement with nature (Friedman et al., 2021) <sup>[60]</sup>.

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### C. Defining NBL and the Resulting Relationship

NBL is defined as learning through exposure to nature and nature-based activities (Jordan & Chawla, 2019) <sup>[40]</sup>. Accordingly, NBL builds a child's relationship with nature. When NBL is explicitly used, children's connection to nature was strengthened and outdoor play behavior increases (Mullenbach et al., 2019) <sup>[61]</sup>. As students' working relationship with nature is strengthened, so does their feelings of relaxation, fun, familiarity, ownership, protection, and kinship in nature; correspondingly, students' feelings of fear and anxiety decrease (Harris, 2021) <sup>[62]</sup>. NBL builds pro-environmental, protective, and advocative bonds; consequently, NBL paves the way for holistic student development and environmental sustainability. When begun in childhood, this symbiotic relationship extends nature connectivity and environmental moral traits into adulthood (Molinario et al., 2020) <sup>[63]</sup>.

### D. Perspectives of NBL

Teacher pedagogy and philosophy paralleling NBL instructional practices facilitate the growth of student leadership and meaningful learning activities; teachers recognize student excitement, interest, engagement, and curiosity as factors contributing to experiential learning (Omidvar et al., 2019) <sup>[64]</sup>. Indeed, a qualitative study of teachers' and students' views of NBL found that teachers found greater student learning readiness after incorporating nature into instruction (Çağlıyan & Altun, 2021) <sup>[65]</sup>. In addition, Scott et al. (2018) <sup>[66]</sup> found that teachers described more significant gains in emotional regulation, behavior skills, independence, and social skills for students with higher levels of exposure to natural environments. Further, after participating in NBL experiences, most teachers wanted to continue practicing and learning NBL practices (Ho et al., 2018) <sup>[67]</sup>. As student teachers participated in NBL-related PD, they felt confident in planning and implementing and increased ratings of the importance of NBL (Torquati et al., 2017) <sup>[68]</sup>.

Students, too, both recognize and delve into the benefits of NBL to their development. A qualitative examination of student drawings showed that children more greatly valued NBL, including outdoor settings, natural components, loose parts, and active behaviors, compared to synthetic environments, plastic play gear, and activities guided by safety measures (Ward, 2018) <sup>[69]</sup>. When participating in NBL, students not only displayed connection to nature, developed practical skills, developed pride, and demonstrated achievement, but expressed investment in their learning and a desire to continue this relation-oriented, educational journey with nature (Hallam et al., 2021) <sup>[70]</sup>. Through NBL offered within the school setting, students demonstrated robust emotional connections to nature, with strong protective outlooks about their relationship with nature (Rios & Menezes, 2017) <sup>[71]</sup>. Students visualized nature as a community and engaged with nature through action; they experienced and acknowledged nature's benefits (Tillmann et al., 2017) <sup>[72]</sup>. Interestingly, children associate negative emotions and anxiety with not being able to play, specifically in outdoor environments (Howard et al., 2017) <sup>[73]</sup>.

Parents see NBL with its support of student development. Parents evaluated aspects of NBL and noted benefits of NBL as child relationships, well-being, and development; these benefits continued past the formal NBL context and into the traditional classroom setting (Ward et al., 2019) <sup>[74]</sup>. Parents also reported children's sensory-motor, emotional, cognitive, and behavioral benefits from NBL and described nature as a supportive, prosperous, safe learning environment (Li et al., 2019) <sup>[75]</sup>. In both the United States and Denmark, parents highly valued outdoor and nature experiences for children within the school environment, with U.S. parents especially noting child developmental benefits (Vandermaas-Peeler et al., 2019) <sup>[76]</sup>.

There is minimal current research literature regarding NBL from the administrator's perspective. In one related study, Harris (2017) <sup>[77]</sup> focused on NBL through education leaders and practitioners at a forest school, exploring details of children's engagement with nature and learning styles within the school. This study, however, did not specify the descriptive characteristics and roles of an education leader or practitioner.

### E. NBL and Equity

NBL has the potential to remove social barriers of inequity, such as accessibility, transportation, and money (see Hallam et al., 2021) <sup>[70]</sup>. Nature provides developmental benefits to all students, regardless of race, age, socioeconomic background, or learning ability. For example, NBL increased the student values of diversity and inclusivity (Beery & Jørgensen, 2018) <sup>[78]</sup>. Children can translate the importance of diversity using a social lens through exposure and the relevance of diversity from a natural lens (Mandalaywala et al., 2019) <sup>[79]</sup>. Children themselves recognized and reported understanding how rules and systems regarding behavior when interacting with nature are the same for all (Yanez et al., 2017) <sup>[80]</sup>.

In addition to the benefits NBL supplies for students of all learning abilities, there are specific advantages NBL can offer students with special needs. For example, elementary students with autism were better equipped and more able to achieve their individualized education plan goals through NBL practices; these included conversation, social skills, verbalizations, identification of feelings, expression of perspectives, identification of social problems, creation of social solutions, task completion, self-regulation, and verbal control (Friedman & Morrison, 2021) <sup>[81]</sup>. NBL settings have shown to be ideal environments for intervention and therapy for students with special needs, specifically applied behavior analysis strategies, by increasing student relaxation, attention, and positivity, while also minimizing restraint and command of children (Li et al., 2019) <sup>[75]</sup>.

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### F. Controversies Associated with NBL

Li et al. (2019) [75] documented concerns with respect to NBL; these included inappropriate behavior, safety, phobias, judgment, social exclusion, boredom, time, and financial burden. However, the authors found that parents agreed that problems and barriers could be mitigated through planning and design. Another study showed that in an outdoor classroom, teachers redirected student behavior less, found fewer children off-task, and recorded overall benefits to student wellbeing (Largo-Wright et al., 2018) [82]. Additionally, although children associated outdoor activities with play, they also associated strong positive emotions with outdoor activities and strong negative emotions with denial of outdoor activities (Howard et al., 2017) [73].

When implementing NBL, settings are often designed to encourage risky play—environments that have the possibility of leading to injury, remove children from comfort, challenging children on multiple domains and promote vulnerability (Harper & Obee, 2021) [83]. Harper and Obee (2021) [83] found children competent in navigating risky situations; further, this risk navigation heightened children's innate learning and abilities. Harper (2017) [84] addressed the risk-averse Western society, showing that through the recognition and explanation of societal perceptions of risk, policy, and practices could be effectively and efficiently reconceptualized. To illuminate, forest schools strive for a balance between safety and risk-taking to accumulate the students' benefits of risk-taking while still maintaining a safe environment as necessary (Maron-Puntarelli, 2020) [57].

Another controversy reflects the idea NBL as not aligned with standardized learning outcomes of the nation or state (McFarland et al., 2013) [85]. Nevertheless, NBL is a mode or medium through which students can learn; it does not require the abandonment of learning objectives or standards. In one example, NBL has been demonstrated to support Common Core Standards through NBL reading and writing instruction (Yigit-Gencten & Gultekin, 2022) [86].

### V. RESEARCH METHOD

We used the basic qualitative approach to conduct this study as it complemented the purpose of this study which was to investigate the human perspectives and experiences of elementary school administrators regarding their understanding of NBL, its support of elementary student development, and its inclusion in elementary schools' curricula and design. The goals of basic, generic qualitative research are to investigate participants' experiences and the meanings they associate with experiences as well as understand participant experiences in the form of processes (Lambert & Lambert, 2012) [87].

The participant selection criterion was current employment as an administrator at a public elementary school within the United States. Administrator experience and involvement with NBL was not a criterion for participant selection. Participation was voluntary, and participants were provided with an informed consent briefing.

The method of data collection was semistructured interviews. In addition to the semistructured interview questions, we employed an elicitation technique using sentence completion stems. These enriched participants' responses by cultivating detail and explanations in verbal answers (see Barton, 2015) [88]. Sentence completion stems promoted information-rich interviews, irrespective of the administrator's experience level with NBL and child development. Furthermore, this elicitation technique allowed us to capture the subjective understandings of participants (see Hogan et al., 2016) [89]. Zoom interviews were both audio- and video-recorded. Interviews with deep, probing questions continued to saturation, the point when additional interviews would have no longer added new information (see Rubin & Rubin, 2012) [90]. At the point of saturation there were 10 participants.

Data analysis comprised six steps regarding data: collection, engagement, extraction, coding, conceptualization, and representation (see Peel, 2020) [91]. Use of Quirkos software, tables, and charts allowed for visual presentations of the data. To establish trustworthiness, we employed reflexivity, an audit trail, and member checking (see Cruz, 2015 [92]; Glaser, 2004 [93]).

### VI. DATA ANALYSIS AND RESULTS

We used the coding procedures outlined by Saldaña (2021) [94], shifting between the stages of data analysis as an iterative process. Regarding thematic analysis, raw data and analytic memos were employed to create codes, categories, themes, and concepts (see Miles et al., 2014) [95]. The Quirkos software, tables, and charts allowed for visual presentations of the data. We moved inductively from coded units to larger representations, including categories and themes. A priori codes were developed prior to data collection. As data were collected, we created open codes. Table I lists a priori codes and open codes created and used. We began with 30 a priori codes, and as we collected data, 23 open codes were created. With the finalization of data collection, we had accumulated a total of 53 a priori and open codes.

Table I. A Priori and Open Codes

<i>A priori codes</i>	<i>Open codes</i>	
Administrative learning	Access to resources	
Administrator experiences	Administrative budgeting	
Barriers	Administrative leadership	
Cognitive	Connection	
Disadvantages	Differentiation	

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Engagement	Equity	
Experiences	Essentiality	
Formal education and development	Generational change	
Learning environments	Immersing	
Learning modes	Mindset	
Learning opportunities	NBL representatives	
Loose parts	Parent initiative	
Nontypically developing students	Passion	
Norming	Possible disadvantages	
Partnership with organization	Promoting NBL as an administrator	
Personal experiences	School district governance	
Physical	School structures	
Positivity	Sharing	
PD	Sharing with stakeholders	
Real-life applications	Teacher reflection	
Reasons for using NBL	Teacher training	
Resources	Understanding	

Running NBL at school	Viewing NBL practices
Social-emotional	
Student benefits	
Teacher initiative	
Time	
Transdisciplinary	
Unstructured play	
Value	

We were able to engage, extract, code, and conceptualize the data using the Quirkos qualitative data analysis software. Participants' responses were highlighted directly from the transcription and then assigned or had codes created for them. The Quirkos software permitted the clustering of related codes and the generation of graphic representation of codes. After data collection, we inserted the transcribed data into the software program organized by participant and interview protocol question and type. As we highlighted parts of the transcription data, we dragged the highlighted section to the code we wanted to assign to that data. The notes function was also used for analytic memos associated to certain participant responses. We created open codes as we went through the engagement, extraction, coding, and conceptualization steps.

As the data analysis process evolved, nine unique themes emerged. In Table II, we organized the nine themes by research question, with each research question having three corresponding themes.

**Table II . Themes Organized by Research Question**

<i>Research question</i>	<i>Themes</i>
RQ1: What are elementary administrators' perspectives and experiences with NBL?	<ol style="list-style-type: none"> <li>1. Administrators included NBL experiences as a teacher and personal NBL experiences from which NBL administrator experience was built.</li> <li>2. Administrators reported a lack of understanding, a fear mindset, and a lack of stakeholder support regarding NBL in schools.</li> <li>3. Administrators shared the essential, imperative quality of NBL.</li> </ol>
RQ2: What are elementary administrators' perspectives of And experiences with how NBL supports student development?	<ol style="list-style-type: none"> <li>4. Administrators reported a generational change in aspects of education and child development as they pertain to nature.</li> <li>5. Administrators shared a variety of NBL student benefits.</li> <li>6. Administrators reported no disadvantages to students from NBL.</li> </ol>
RQ3: What are elementary administrators' perspectives of and experiences with how NBL is included in curricula and design?	<ol style="list-style-type: none"> <li>7. Reasons for using NBL within a school vary, but the most consistent reason is partnership with a NBL organization, representative, or resource.</li> </ol>

8. Administrators reported the importance of district support for NBL.
  9. Administrators expressed a need for NBL PD as well as difficulty regarding PD scheduling and time management.
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The results of this qualitative study are presented in the form of nine themes, serving as answers to the three research questions. We used similarities and patterns in the data to create nine themes, each aligned to one of the three research questions. Although there were differences among data, there were no discrepant cases.

The first theme that emerged from the patterns within the coding aligned to RQ1 was: Administrators included NBL experiences as a teacher and personal NBL experiences as foundational experiences from which NBL administrator experience was built. We used the following 10 codes to develop this theme: administrative budgeting, administrative leadership, administrator experiences, experiences, formal education and development, passion, personal experiences, promoting NBL as an administrator, running NBL at school, teacher reflection. A similarity across participants existed in personal and past NBL experiences driving administrative NBL perspectives and experiences. Indeed, personal experiences included personal emotions associated with nature and NBL. For example, Participant 2 stated, "I haven't had any formal training with it, but I just have a passion for it." In another example, Participant 3 stated, "Most of it has come from just me, immersing myself in this belief." Participants used their past experiences as foundational to their current NBL perspectives and experiences. Another example of this was expressed by Participant 4, saying "My experience with NBL is as a kid and as a student. That's where it starts and in my life experiences. Then transition into becoming a teacher and being responsible for teaching it. And now it's making opportunities possible." This similarity, personal and past experiences of NBL driving the administrative perspectives and experiences with NBL, ran across participant responses.

The second theme that appeared from the patterns within the coding aligned to RQ1 was: Administrators reported a lack of understanding, a fear mindset, and a lack of support from stakeholders regarding NBL in schools. We used the following nine codes to develop this theme: barriers, immersing, mindset, norming, school structures, sharing, sharing with stakeholders, understanding, value, and viewing NBL practices. Most participants noted mindset, overall, as a barrier, asset, and value-creator for NBL. This mindset idea was in reference to all stakeholders: students, teachers, parents, communities, administrations, and districts. For example, Participant 5 explained, "NBL would be more valued if educators and students had proper understanding and knowledge of all that it encompasses." Additionally, Participant 6 stated, "Making NBL a norm would require district and community support." The similarity of a lack of understanding, a fear mindset, and a lack of support from stakeholders regarding NBL in schools was shared from all participants in a direct or indirect manner.

The third theme that materialized from the patterns within the coding aligned to RQ1 was: Administrators shared the essential, imperative quality of NBL. All participants discussed the essentiality and student benefits of NBL. Accordingly, we used two codes to develop this theme: essentiality and student benefits. There were a variety of levels of essentiality of NBL in schools. For Example, Participant 2 stated, "I think it's even more important that it happens at school," when comparing home and school environments regarding NBL and nature. When discussing the importance of NBL at school, Participant 3 said "NBL should be essential for every public school, K-12. It needs to happen." Administrators expressed how NBL was indispensable. We recorded administrators' sharing the essential, imperative quality of NBL in all interviews.

The fourth theme that emerged from the patterns within the coding, aligned to RQ2, was: Administrators reported a generational change in aspects of education and child development as they pertain to nature. We used the following six codes to develop this theme: generational change, learning environments, loose parts, real-life applications, student benefits, and unstructured play. Participants' responses yielded the similarity in reporting of this generational change, especially concerning the relationship between education, child development, and nature.

The fifth theme, related to RQ2, was: Administrators shared a variety of NBL student benefits. We used the following 13 codes to construct this theme: cognitive, connection, differentiation, engagement, equity, learning modes, learning opportunities, non-typically developing students, physical, positivity, social-emotional, student benefits, and transdisciplinary. In one example, Participant 7 shared the overarching idea of this theme when stating NBL fosters "all kinds of development. It is wholly beneficial in every way." In this analysis, we grouped the ideas of this theme into three categories: differentiation, domains of child development, and NBL specialties.

Theme 6, aligned to RQ2, was: Administrators reported no disadvantages to students from NBL. We used the following two codes to build this theme: disadvantages and possible disadvantages. No participant shared disadvantages to students occurring from NBL. About half of participants shared potential disadvantages, although these were not always student focused.

The seventh theme, which was aligned to RQ3, was: Reasons for using NBL within a school vary, but the most consistent reason is partnership with a NBL organization, representative, or resource. We used the following seven codes to construct this theme: NBL representatives, parent initiative, partnership with organization, reasons for using NBL, school structures, teacher initiative, and teacher training. Participant 1 described the main idea of this theme when saying, "because the pairing with that organization makes sure all that stuff happens." Furthermore, Participant 2 explained this main idea, stating, "If you don't have somebody to maintain it and help drive that, and keep the excitement going, then it just fizzles out."

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Theme 8 was: Administrators reported the importance of district support for NBL. We used the following four codes to create this theme: access to resources, barriers, resources, time. Participant 8 expressed the main idea of this theme when stating, "Including nature into school curricula and design would need to be valued by the district in order to be integrated." Administrators reported described district support in a variety of ways, including buy-in, resources, time, money, and school structures.

The ninth and final theme, aligned to RQ3, was: Administrators expressed a need for NBL PD, as well as difficulty regarding PD scheduling and time management. We used the following two codes to build this theme: administrative learning and PD. Participant 7 explained the need for PD, saying, "Education standards can be met in an outdoor environment with a skilled instructor. All day, every day." Further, Participant 9 explained how PD was a need, but time was a barrier to implementation, stating, "Time is a problem. Our new curriculum adoptions take up most of the PD timeslots." As such, Themes 8 and 9 are linked in that the school district played a role in the effective implementation of NBL within schools, first through school district supports, second through school district PD.

Our implementation of trustworthiness criteria went according to plan through the practice of credibility, transferability, dependability, and confirmability (see Stahl & King, 2020) <sup>[96]</sup>. We established credibility, or internal validity, to ensure the study conducted its intended investigation through reflexivity, peer review, and the implementation of well-established research practices (see Shenton, 2004) <sup>[97]</sup>. We guaranteed the potential for transferability, or external validity, by providing a thick description of the procedures, background, participants, and study details for others to draw and apply their inferences appropriately and meaningfully (see Lincoln & Guba, 1985) <sup>[98]</sup>. We achieved dependability, assuring the study is repeatable and consistent over time (see Morse, 2015) <sup>[99]</sup>, by maintaining an audit trail (see Glaser, 2004) <sup>[93]</sup>. Finally, we established confirmability with reflexive journaling (see Ellis, 2019) <sup>[100]</sup>. These strategies combined to for trustworthiness, strengthening the study and its findings.

## VII. DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

### A. Finding 1: Experiences With NBL Build Professional Perspectives of NBL, Symbiotic Relationship Between Human Nature, and Propensity to Utilize NBL

Administrators included personal NBL experiences and NBL experiences as a teacher as foundational experiences from which NBL administrator experience was built. There was a connection established between administrators' experiences with NBL and administrators' current practices with NBL. All administrators in this study somehow linked current NBL practices back to personal and teaching experiences with NBL. These personal, perhaps childhood, experiences and perspectives of NBL from administrators extended into their adulthood and career as administrators. The extension of childhood NBL experiences and perspectives from childhood to adulthood confirmed research literature. Furthermore, this study extends knowledge on childhood NBL experiences and perspectives extending from childhood not only into adulthood but also into careers.

### B. Finding 2: NBL is not yet supported by Most Educational Stakeholders

Administrators reported a lack of understanding, a fear mindset, and a lack of stakeholder support regarding NBL in schools. Administrators also reported a generational change in aspects of education and child development as they pertain to nature. Finding 2, NBL is not yet supported by most education stakeholders, portrays the current support for NBL from all education stakeholder fronts by considering rationale for said support levels. Finding 2 is reflected through the general lack of understanding of NBL and demonstrated through current norms in U.S. public schools, including limited unstructured, outdoor play (see Biccella, 2019), the rarity of outdoor education (see Tate, 2020) <sup>[101]</sup>, lack of natural play areas (see Trust for Public Land, 2022) <sup>[29]</sup>, and lack of green spaces (see Feldman, 2019 <sup>[31]</sup>; Kweon et al., 2017 <sup>[30]</sup>; Moreno et al., 2015). Not only did Finding 2 corroborate the established research literature and related principles, but it extended findings on nature-deficit disorder to a different realm—education and early child development.

### C. Finding 3: NBL is an Indispensable Element of Child Development and Education

Administrators shared the essential, imperative quality of NBL; a variety of NBL student's benefits; and no disadvantages to students from NBL. Finding 3 extends the research literature because research on the administrators' perspective of NBL is limited. Overall, Finding 3 extends the research literature through the sharing of administrators' direct experiences with and perspectives of NBL. Particularly, NBL was identified as an indispensable element of child development and education.

### D. Finding 4: Partnership and Collaboration, Both Vertical and Horizontal, is Required at the District Level to Incorporate NBL in U.S. Public Schools

The most consistent reason schools use NBL is partnership with a NBL organization, representative, or resource. Concurrently, district support for NBL initiatives in schools is pivotal. For example, there is a voiced need for NBL PD, with district logistics making this PD for NBL almost impossible. Authority does not lie with most teachers regarding curriculum content, topics, and skills taught in their classrooms. Likewise, a large portion of authority does not lie with administrators for certain initiatives and logistical components; instead, authority lies with school districts. Finding 4 extended the research literature indicating that incorporation of NBL in U.S. public schools needs partnership and collaboration, both vertical and horizontal, at the school district level.



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### E. Limitations

Limitations included components related to transferability, such as sample size, researcher bias, and location. The sample size could minimize generalizability. Our potential researcher bias, personal and professional experiences with NBL, and involvement with NBL integration within schools could have influenced the semistructured interviews, possibly minimizing the credibility of the study. We accounted location and digital interviewing as limitations since all interviews were conducted via video Zoom interview. Location limited the study to participants with access to technology with capacity for Zoom interviewing.

### F. Recommendations

Our first recommendation involves further research. Specifically, we recommend a qualitative study focusing on NBL, its support of elementary student development, and its inclusion in elementary schools' curricula and design from the elementary, public school district perspective. Also, we recommend a quantitative study focusing on the effect of NBL on student learning and child development over time.

With Finding 1, we explained how experiences with NBL build professional perspectives of NBL, symbiotic relationship between human-nature, and propensity to utilize NBL. Recommendation 1 is the integration and normalization of NBL into all U.S. public school districts, transitional kindergarten through Grade 12. Recommendation 1 would then prompt school districts to take NBL resources, and explicitly use them in NBL initiatives at the district and school levels.

In Finding 2, we reported how NBL is not yet supported by most education stakeholders. Thus, Recommendation 2 is accessibility to NBL by all education stakeholders. For example, organizations, such as the Natural Start Alliance of the North American Association for Environmental Education (2019) <sup>[102]</sup>, have presented research supporting NBL and have advocated for NBL at the early childhood level. Recommendation 2 would prompt NBL organizations to extend reach to all education stakeholders in a focused, equitable, and clear fashion.

With Finding 3, we discussed how NBL is an indispensable element of child development and education. This observation was evidenced through NBL's benefits to each child development domain (Sailakumar & Naachimuthu, 2017), as well as a variety of other student benefits, such as equity and spirituality (Beery & Jørgensen, 2018 <sup>[78]</sup>; Hallam et al., 2021 <sup>[70]</sup>; Mandalaywala et al., 2019). So, Recommendation 3 is district-provided PD for all elementary teachers and administrators.

Through Finding 4, we stated how partnership and collaboration, both vertical and horizontal, was required at the district level to incorporate NBL in U.S. public schools. Currently, for example, less than 1.7% of the state educational agencies, such as school districts, have formal collaborations with outdoor schools (California Department of Education, 2022a). Thus, Recommendation 4 is formal partnership between each U.S. public school district and a NBL organization.

### G. Implications and Conclusions

These findings may be used to inform positive social change at the individual, family, organizational, and policy levels. The knowledge gleaned in this study can catalyze positive social change, as it provides current information about NBL from the viewpoint of administrative leaders in the education field. Stakeholders can use this knowledge from elementary administrators' perspectives and experiences surrounding nature-based learning, its support of elementary student development, and its inclusion in elementary schools' curricula and design to make cognizant judgments about NBL. Particularly, understanding about NBL could positively affect future policy and planning in the education field and generate positive social change within schools across the nation (see Frantzeskaki, 2019) <sup>[50]</sup>. Cumulatively, we advocate further research and four recommendations for practice: the integration and normalization of NBL into all U.S. public school districts, transitional kindergarten through Grade 12; accessibility to NBL by all education stakeholders; district-provided PD for all elementary teachers and administrators; and formal partnership between each U.S. public school district and a NBL organization.

## REFERENCES

- 1) Sobel, D. (2019). *A return to nature-based education*. <https://www.yesmagazine.org/environment/2019/12/13/nature-based-education>
- 2) Louv, R. (2008). *Last child in the woods: Saving our children from nature deficit disorder*. Algonquin Books of Chapel Hill.
- 3) Child Mind Institute, Inc. (2022). *Why kids need to spend time in nature*. [https://childmind.org/article/why-kids-need-to-spend-time-in-nature/#full\\_article](https://childmind.org/article/why-kids-need-to-spend-time-in-nature/#full_article)
- 4) Sanyaolu, A., Okorie, C., Qi, X., Locke, J., & Rehman, S. (2019). Childhood and adolescent obesity in the United States: A public health concern. *Global Pediatric Health*, 6, 1–11. <https://doi.org/10.1177/2333794X19891305>
- 5) Lebrun-Harris, L.A., Ghandour, R.M., Kogan, M.D., & Warren, M.D. Five-year trends in U.S. children's health and well-being, 2016–2020. *JAMA Pediatrics*, 176(7), 1-11. <https://jamanetwork.com/journals/jamapediatrics/article-abstract/2789946>
- 6) Pew Research Center. (2022). *Children's engagement with digital devices, screen time*. <https://www.pewresearch.org/internet/2020/07/28/childrens-engagement-with-digital-devices-screen-time/>

## Qualitative Investigation of K-6 Administrators' Perceptions of Nature- Based Learning

- 7) Hales, C. M., Kit, B. K., Gu, Q., & Ogden, C. L. Trends in prescription medication use among children and adolescents- United States. *JAMA*, 319(19), 2009–2020. <https://doi.org/10.1001/jama.2018.5690>
- 8) Cision U.S. Inc. (2022). *New survey on free time illustrates the challenges today's families face in an age of screens*. <https://www.prnewswire.com/news-releases/new-survey-on-free-time-illustrates-the-challenges-todays-families-face-in-an-age-of-screens-300684439.html>
- 9) Albritton, C. D. (2016). *The loss of innocence in America's childhood: The Adam Walsh murder and the media's impact on culture and legislation* (unpublished master's thesis). University of Louisiana at Lafayette. Lafayette, Louisiana.
- 10) Greigo, D., & Kitzler, L. (1985, May 12). *The truth about missing kids: Exaggerated statistics stir national paranoia*. *The Sunday Denver Post*.
- 11) *Hysteria about missing children*. (1986). *U.S. News and World Report*, 100(6).
- 12) Simpson, K. (2010, November 27). *Dispelled kidnap myths do little to allay parents' fears*. *The Denver Post*. <https://www.denverpost.com/2010/11/27/dispelled-kidnap-myths-do-little-to-allay-parents-fears/>
- 13) Johnson, K. M., & Lichter, D. T. (2019). *Rural depopulation: Growth and decline processes over the past century*. *Rural Sociology*, 84(1), 3-27. <https://doi.org/10.1111/ruso.12266>
- 14) Compton, J. L. *Implications of the rise and decline of golf*. (2020, June 25). *Parks & Recreation*. <https://www.nrpa.org/parks-recreation-magazine/2020/july/implications-of-the-rise-and-decline-of-golf/>
- 15) *Decline in hunting and fishing hurts stage coffers*. (2008, March 29). *NBC News*. <https://www.nbcnews.com/id/wbna23860020>
- 16) *Is summer camp dying?* (2015, January 10). *The Week*. <https://theweek.com/articles/493466/summer-camp-dying>
- 17) Sellers, F. S. (2020, February 22). *Hunting is 'slowly dying off,' and that has created a crisis for the nation's many endangered species*. *The Washington Post*. [https://www.washingtonpost.com/national/hunting-is-slowly-dying-off-and-that-has-created-a-crisis-for-the-nations-public-lands/2020/02/02/554f51ac-331b-11ea-a053-dc6d944ba776\\_story.html](https://www.washingtonpost.com/national/hunting-is-slowly-dying-off-and-that-has-created-a-crisis-for-the-nations-public-lands/2020/02/02/554f51ac-331b-11ea-a053-dc6d944ba776_story.html)
- 18) Chawla, L. (2021). *Knowing nature in childhood: Learning and well-being through engagement with the natural world*. *Nature and Psychology*, 67, 153–193. [https://doi.org/10.1007/978-3-030-69020-5\\_6](https://doi.org/10.1007/978-3-030-69020-5_6)
- 19) *Voice of Play*. (2022). *2018 Survey on Recess*. <https://voiceofplay.org/2018-survey-recess/>
- 20) Biccella, A. (2019). *Time to play: Increasing daily recess in elementary schools*. EAB. <https://eab.com/insights/expert-insight/district-leadership/time-to-play-increasing-daily-recess-in-elementary-schools/>
- 21) Cornell Law School. (2022). *28 CFR §551.115 – Recreation*. <https://www.law.cornell.edu/cfr/text/28/551.115>
- 22) Gardner, W. (2015, November 4). *Arts education takes a hit in the accountability movement*. *Education Week*. <https://www.edweek.org/education/opinion-arts-education-takes-a-hit-in-the-accountability-movement/2015/11>
- 23) Jeres, J. *The consequences of cutting music programs in K-12 public schools* (unpublished master's thesis). California State University of Monterey Bay. Monterey, California. [https://digitalcommons.csmb.edu/cgi/viewcontent.cgi?article=2333&context=caps\\_thes\\_all](https://digitalcommons.csmb.edu/cgi/viewcontent.cgi?article=2333&context=caps_thes_all)
- 24) Rix, K. (2022, October 14). *How much recess should kids get?: Experts say recess is crucial to learning and development, but many kids don't get enough*. *US News and World Report*. <https://www.usnews.com/education/k12/articles/how-much-recess-should-kids-get>
- 25) De Moraes, J. A., De Barcelos, G. T., Coneglian, J. C., de Raos Do Espirito Santo, B. C., & Gerage, A. M. (2022). *Combined training with aerobic exercise performed outdoors can promote better blood pressure and affective responses in individual with cardiovascular risk factors*. *International Journal of Environmental Research and Public Health*, 19, 16009. <https://doi.org/10.3390/ijerph192316009>
- 26) Moslehi, E., Moslehi, Z., & Khalvati, B. (2019). *Playing in the form of outdoor exercise is more effective than indoor treadmill exercise on serum Orein-A and weight loss in obese adolescent boys*. *Obesity Medicine*, 15, 100104.
- 27) Noseworthy, M., Preddie, L., Buckler, E. J., Park, F., Pham, M., Pratt, S., Singh, A., Puterman, E., & Liu-Ambrose, T. (2023). *The effects of outdoor versus indoor exercise on psychological health, physical health, and physical activity behavior: A systematic review of longitudinal trials*. *Journal of Environmental Research and Public Health*, 20(3), 1669. <https://doi.org/10.3390/ijerph20031669>
- 28) Tate, E. (2020). *What if schools viewed outdoor learning as 'Plan A'?* <https://www.edsurge.com/news/2020-10-05-what-if-schools-viewed-outdoor-learning-as-plan-a>
- 29) Trust for Public Land. (2022). *Community schoolyards projects: A game-changing solution to America's park equity problem*. <https://www.tpl.org/community-schoolyards-report-2021>
- 30) Kweon, B., Ellis, C., Lee, J., & Jacobs, K. (2017). *The link between school environments and student academic performance*. *Urban Forestry & Urban Greening*, 23(April 2017), 35–43. <https://doi.org/10.1016/j.ufug.2017.02.002>
- 31) Feldman, N. (2019). *Why your neighborhood school probably doesn't have a playground*. <https://why.org/articles/uneven-play-most-philadelphia-public-schools-dont-have-playgrounds-thats-slowly-changing/>
- 32) Moreno, A., Tangenberg, J., Hilton, B., & Hilton, J. (2015). *An environmental assessment of school shade tree canopy and*

## Qualitative Investigation of K-6 Administrators' Perceptions of Nature- Based Learning

- implications for sun safety policies: The Los Angeles Unified School District. *ISPRS International Journal of Geo-Information*, 4(2), 607–625. <https://doi.org/10.3390/ijgi4020607>
- 33) Chawla, L. (2015). Benefits of nature contact for children. *Journal of Planning Literature* 30(4), 433–452. <https://doi.org/10.1177/0885412215595441>
- 34) Suttie, J. (2016). *How to protect kids from nature-deficit disorder*. [https://greatergood.edu/article/item/how\\_to\\_protect\\_kids\\_from\\_nature\\_deficit\\_disorder](https://greatergood.edu/article/item/how_to_protect_kids_from_nature_deficit_disorder)
- 35) U.S. Department of Education. (2021). *Highlights from the 2021 honorees*. <https://www2.ed.gov/programs/green-ribbon-schools/highlights-2021.pdf>
- 36) California Department of Education. (2022a). *California Outdoor Schools Association*. <https://www.cde.ca.gov/pd/ca/sc/oecosa.asp>
- 37) Economic Policy Institute. (2019). *More than half of teachers do not feel supported, and one in four has considered quitting as a result*. <https://www.epi.org/press/more-than-half-of-teachers-do-not-feel-supported-and-one-in-four-has-considered-quitting-as-a-result-challenging-working-environment-contributes-to-the-teacher-shortage/>
- 38) Rotas, N. (2019). Outdoor play and learning (OPAL): Activating “loose parts” in undisciplined childhood environments. *International Journal of Early Childhood Environmental Education*, 7(1), 73–85.
- 39) Kuo, M., Barnes, M., & Jordan, C. (2019). Do experiences with nature promote learning? Converging evidence of a cause-and-effect relationship. *Frontiers in Psychology*, 10, 1–9. <https://doi.org/10.3389/fpsyg.2019.00305>
- 40) Jordan, C., & Chawla, L. (2019). A coordinated research agenda for nature-based learning. *Frontiers in Psychology*, 10(April 2019), 766. <https://doi.org/10.3389/fpsyg.2019.00766>
- 41) Kuo, M., & Jordan, C. (2019). Do experiences with nature promote learning? Converging evidence of a cause-and-effect relationship. *Frontiers in Psychology*, 10, 1–9. <https://doi.org/10.3389/fpsyg.2019.00305>
- 42) Dale, R. G., Powell, R. B., Stern, M. J., & Garst, B. A. (2020). Influence of the natural setting on environmental education outcomes. *Environmental Education Research*, 26(5), 613–631. <https://doi.org/10.1080/13504622.2020.1738346>
- 43) Harvey, D. J., Montgomery, L. N., Harvey, H., Hall, F., Gange, A. C., & Watling, D. (2020). Psychological benefits of a biodiversity-focused outdoor learning program for primary school children. *Journal of Environmental Psychology*, 67, 1–8. <https://doi.org/10.1016/j.jenvp.2019.101381>
- 44) Schilhab, T. (2021). Nature experiences in science education in school: Review featuring learning gains, investments, and costs in view of embodied cognition. *Frontiers in Education*, 6, 1–19. <https://doi.org/10.3389/educ.2021.739408>
- 45) Annisa, A., & Sutapa, P. (2019). The implementation of nature-based learning models to improve children’s motor skills. *Jurnal Obsesi*, 3(1), 170–182. <https://doi.org/10.31004/obsesi.v3i1.140>
- 46) Rymanowicz, K., Hetherington, C., & Larm, B. (2020). Planting the seeds for nature-based learning: Impacts of a farm- and nature-based early childhood education program. *International Journal of Early Childhood Environmental Education*, 8(1), 44–63.
- 47) Grissom, J. A., Egalite, A. J., & Lindsay, C. A. (2021). *How principals affect students and schools: A systematic synthesis of two decades of research*. The Wallace Foundation. <http://www.wallacefoundation.org/principalsynthesis>.
- 48) Burke, A., Moore, S., Molyneux, L., Lawlor, A., Kottwitz, T., Yurich, G., Sanson, R., Andersen, O., & Card, B. (2021). Children’s wellness: Outdoor learning during Covid-19 in Canada. *Education in the North*, 28(2), 24–45. <https://doi.org/10.26203/p99r-0934>
- 49) Harper, N. J., Lim, C., Alqallaf, H., & Naylor, P. J. (2021). A case study exploring the “real world” process of “naturalizing” school playgrounds. *International Journal of Environmental Health Research*, 31(3), 298–314. <https://doi.org/10.1080/09603123.2019.1656174>
- 50) Frantzeskaki, N. (2019). Seven lessons for planning nature-based solutions in cities. *Environmental Science & Policy*, 93(March 2019), 101–111.
- 51) Miller, N. C., Kumar, S., Pearce, K. L. & Baldock, K. L. (2021). The outcomes of nature-based learning for primary school-aged children: A systematic review of quantitative research. *Environmental Education Research*, 27(8), 1115–1140. <https://doi.org/10.1080/13504622.2021.1921117>
- 52) Nicholson, S. (1972). The theory of loose parts: An important principle for design methodology. *Studies In Design Education Craft & Technology*, 4(2), 5–14. <https://ojs.lboro.ac.uk/SDEC/article/view/1204>
- 53) National Association for the Education of Young Children. (2022). *Principles of child development and learning and implications that inform practice*. <https://www.naeyc.org/resources/position-statements/dap/principles>
- 54) Gençer, A. A., & Avci, N. (2017). The treasure in nature! Loose part theory. *Current Trends in Educational Sciences*, 9, 9–16.
- 55) Bates, E. (2018). Can natural history collections support a connection to nature for young children and families? *Museum & Society*, 16(3), 369–382. <https://doi.org/10.29311/mas.v16i3.2795>
- 56) Dean, S. (2019). Seeing the forest and the trees: A historical and conceptual look at Danish forest schools. *International Journal of Early Childhood Environmental Education*, 6(3), 53–63.

## Qualitative Investigation of K-6 Administrators' Perceptions of Nature- Based Learning

- 57) Maron-Puntarelli, C. (2020). Walking into the woods: Understanding German waldkindergärtens. *YC: Young Children*, 75(1), 42–50.
- 58) Shimek, C. (2021). “Let nature be your teacher”: An ecocritical analysis of outdoor play in award-winning picturebooks in the United States. *Journal of Children’s Literature*, 47(1), 51–61.
- 59) Dickson, T. J., & Gray, T. L. (2022). Nature-based solutions: Democratising the outdoors to be a vaccine and a salve for a neoliberal and COVID-19 impacted society. *Journal of Adventure Education & Outdoor Learning*, 1–20. <https://doi.org/10.1080/14729679.2022.2064887>
- 60) Friedman, S., Imrie, S., Fink, E., Gedikoglu, M., & Hughes, C. (2022). Understanding changes to children’s connection to nature during the COVID-19 pandemic and implications for child well-being. *People and Nature*, 4(1), 155–165. <https://doi.org/10.1002/pan3.10270>
- 61) Mullenbach, L. E., Andrejewski, R. G., & Mowen, A. J. (2019). Connecting children to nature through residential outdoor environmental education. *Environmental Education Research*, 25(3), 365–374. <https://doi.org/10.1080/13504622.2018.1458215>
- 62) Harris, F. (2021). Developing a relationship with nature and place: The potential role of forest school. *Environmental Education Research*, 27(8), 1214–1228. <https://doi.org/10.1080/13504622.2021.1896679>
- 63) Molinario, E., Lorenzi, C., Bartoccioni, F., Perucchini, P., Bobeth, S., Colléony, A., Diniz, R., Eklund, A., Jaeger, C., Kibbe, A., Richter, I., Ruepert, A., Sloot, D., Udall, A. M., & Bonaiuto, M. (2020). From childhood nature experiences to adult pro-environmental behaviors: An explanatory model of sustainable food consumption. *Environmental Education Research*, 26(8), 1137–1163. <https://doi.org/10.1080/13504622.2020.1784851>
- 64) Omidvar, N., Wright, T., Beazley, K., & Seguin, D. (2019). Examining children’s indoor and outdoor nature exposures and nature-related pedagogic approaches of teachers at two Reggio-Emilia preschools in Halifax, Canada. *Journal of Education for Sustainable Development*, 13(2), 215–241. <https://doi.org/10.1177/0973408219872066>
- 65) Çağlıyan, T., & Altun, T. (2021). Investigating views of classroom teachers and students on the interaction of children with nature. *Kastamonu Education Journal*, 29(1), 37–51. <https://doi.org/10.24106/kefdergi.4166>
- 66) Scott, J. T., Kilmer, R. P., Wang, C., Cook, J. R., & Haber, M. G. (2018). Natural environments near schools: Potential benefits for socio-emotional and behavioral development in early childhood. *American Journal of Community Psychology*, 62(3/4), 419–432. <https://doi.org/10.1002/ajcp.12272>
- 67) Ho, L. T. K., Vu, P. T. T., & Nguyen, N. T. H. (2018). Valuing nature in childhood. *IZE Journal*, 54, 13–16.
- 68) Torquati, J., Leeper-Miller, J., Hamel, E., Hong, S.-Y., Sarver, S., & Rupiper, M. (2017). “I have a hippopotamus!”: Preparing effective early childhood environmental educators. *New Educator*, 13(3), 207–233. <https://doi.org/10.1080/1547688X.2017.1331095>
- 69) Ward, K. (2018). What’s in a dream? Natural elements, risk and loose parts in children’s dream playspace drawings. *Australasian Journal of Early Childhood*, 43(1), 34. <https://doi.org/10.23965/AJEC.43.1.04>
- 70) Hallam, J., Gallagher, L., & Harvey, C. (2021). “I don’t wanna go. I’m staying. This is my home now.” Analysis of an intervention for connecting young people to urban nature. *Urban Forestry & Urban Greening*, 65(November 2021), 1–9. <https://doi.org/10.1016/j.ufug.2021.127341>
- 71) Rios, C., & Menezes, I. (2017). ‘I saw a magical garden with flowers that people could not damage!’: Children’s visions of nature and of learning about nature in and out of school. *Environmental Education Research*, 23(10), 1402–1413. <https://doi.org/10.1080/13504622.2017.1325450>
- 72) Tillmann, S., Button, B., Coen, S. E., & Gilliland, J. A. (2019). “Nature makes people happy, that’s what it sort of means:” Children’s definitions and perceptions of nature in rural Northwestern Ontario. *Children’s Geographies*, 17(6), 705–718. <https://doi.org/10.1080/14733285.2018.1550572>
- 73) Howard, J., Miles, G. E., Rees, D. L., & Bertenshaw, E. J. (2017). Play in middle childhood: Everyday play behaviour and associated emotions. *Children & Society*, 31(5), 378–389. <https://doi.org/10.1111/chso.12208>
- 74) Ward, T., Goldingay, S., & Parson, J. (2019). Evaluating a supported nature play programme, parents’ perspectives. *Early Child Development and Care*, 189(2), 270–283. <https://doi.org/10.1080/03004430.2017.1317764> Li et al., 2019
- 75) Li, D., Larsen, L., Yang, Y., Wang, L., Zhai, Y., & Sullivan, W. C. (2019). Exposure to nature for children with autism spectrum disorder: Benefits, caveats, and barriers. *Health and Place*, 55, 71–79. <https://doi.org/10.1016/j.healthplace.2018.11.005>
- 76) Vandermaas-Peeler, M., Dean, C., Biehl, M. S., & Mellman, A. (2019). Parents’ beliefs about young children’s play and nature experiences in Danish and US contexts. *Journal of Adventure Education and Outdoor Learning*, 19(1), 43–55.
- 77) Harris, F. (2017). The nature of learning at forest school: Practitioners’ perspectives. *Education 3-13*, 45(2), 272–291.
- 78) Beery, T., & Jørgensen, K. A. (2018). Children in nature: Sensory engagement and the experience of biodiversity. *Environmental Education Research*, 24(1), 13–25. <https://doi.org/10.1080/13504622.2016.1250149>
- 79) Mandalaywala, T. M., Ranger-Murdock, G., Amodio, D. M., & Rhodes, M. (2019). The nature and consequences of essentialist beliefs about race in early childhood. *Child Development*, 90(4), e437. <https://doi.org/10.1111/cdev.13008>
- 80) Yanez, R. E., Fees, B. S., & Torquati, J. (2017). Preschool children’s biophilia and attitudes toward nature: The effect of personal experiences. *International Journal of Early Childhood Environmental Education*, 5(1), 57–67. <https://doi.org/10.14813/ibra.2017.v>

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- 81) Friedman, S., & Morrison, S. (2021). "I just want to stay out there all day": A case study of two special educators and five autistic children learning outside at school. *Frontiers in Education*, 6(May 2021), 1–15. <https://doi.org/10.3389/educ.2021.668991>
- 82) Largo-Wight, E., Guardino, C., Wludyka, P. S., Hall, K. W., Wight, J. T., & Merten, J. W. (2018). Nature contact at school: The impact of an outdoor classroom on children's well-being. *International Journal of Environmental Health Research*, 28(6), 653–666. <https://doi.org/10.1080/09603123.2018.1502415>
- 83) Harper, N. J., & Obee, P. (2021). Articulating outdoor risky play in early childhood education: Voices of forest and nature school practitioners. *Journal of Adventure Education and Outdoor Learning*, 21(2), 184–194.
- 84) Harper, N. J. (2017). Outdoor risky play and healthy child development in the shadow of the "risk society": A forest and nature school perspective. *Child & Youth Services*, 38(4), 318–334. <https://doi.org/10.1080/0145935X.2017.1412825>
- 85) McFarland, A. L., Glover, B. J., Waliczek, T. M., & Zajicek, J. M. (2013). The effectiveness of the national wildlife federation's schoolyard habitat program: Fourth-grade students' standardized science test scores and science grades. *HORTTECHNOLOGY*, 23(2), 187–193.
- 86) Yigit-Gencten, V., & Gultekin, M. (2022). Nature-based reading and writing instructions in early childhood education: The Giving Tree example. *Environmental Education Research*, 28(1), 95-108. <https://doi.org/10.1080/13504622.2021.2015294>
- 87) Lambert, V. A., & Lambert, C. E. (2012). Qualitative descriptive research: An acceptable design. *Pacific Rim International Journal of Nursing Research*, 16(4), 255–256.
- 88) Barton, K. C. (2015). Elicitation techniques: Getting people to talk about ideas they don't usually talk about. *Theory & Research in Education*, 43(2), 198–205. <https://doi.org/10.1080/00933104.2015.1034392>
- 89) Hogan, T., Hinrichs, U., & Hornecker, E. (2016). The elicitation interview technique: Capturing people's experiences of data representations. *IEEE Transactions on Visualization and Computer Graphics*, 22(12), 2579–2593. <https://doi.org/10.1109/TVCG.2015.2511718>
- 90) Rubin, H.J., & Rubin, I.S. (2012). *Qualitative Interviewing: The Art of Hearing Data*. 3<sup>rd</sup> Edition, Sage Publications, Thousand Oaks.
- 91) Peel, K. L. (2020). A beginner's guide to applied educational research using thematic analysis. *Practical Assessment, Research, and Evaluation*, 25(1), 2.
- 92) Cruz, L. (2015). Self-reflexivity as an ethical instrument to give full play to our explicit and implicit subjectivity as qualitative researchers. *The Qualitative Report*, 20(10), 1723–1735. <https://doi.org/10.46743/2160-3715/2015.2353>
- 93) Glaser, B. G. (2004). Naturalist inquiry and grounded theory. *Forum: Qualitative Social Research*, 5(1), 1–14.
- 94) Saldaña, J. (2021). *The coding manual for qualitative researchers*. Sage.
- 95) Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.) Sage.
- 96) Stahl, N. A., & King, J. R. (2020). Expanding approaches for research: Understanding and using trustworthiness in qualitative research. *Journal of Developmental Education*, 44(1), 26–28.
- 97) Shenton, A. K. (2004) Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63–75. <https://doi.org/10.3233/EFI-2004-22201>
- 98) Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.
- 99) Morse, J. M. (2015). Critical analysis of strategies for determining rigor in qualitative inquiry. *Qualitative Health Research*, 25(9), 1212–1222. <https://doi.org/10.1177/1049732315588501>
- 100) Ellis, P. (2019). The language of research (Part 20): Understanding the quality of a qualitative paper (2). *Wounds U.K.*, 15(1), 110–111.
- 101) Tate, E. (2020). *What if schools viewed outdoor learning as 'Plan A'?* <https://www.edsurge.com/news/2020-10-05-what-if-schools-viewed-outdoor-learning-as-plan-a>
- 102) North American Association for Environmental Education. (2019). *Natural start alliance: Research*. <https://naturalstart.org/research>



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