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"We're Trying to Find Cool Things in the Forest" – Exploring Children's Curiosity and Creativity in the Outdoors

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Abstract

Curiosity and creativity are crucial for children's learning and engagement within their worlds. However, research on creative teaching that also addresses children's curiosity is quite limited. In this case study, we adopted visual methods in combination with video-stimulated recall dialogue (VSRD) to explore children's experiences in a Forest School (FS) program in Southern Ontario. As researchers, we were particularly interested in the nexus of children's curiosity and creativity in the process of learning. Participating children, aged 6-12 years, wore GoPro cameras to document their lived experiences in the FS. Informed by constructivism, we examined data vignettes, querying the role of curiosity and creativity within children's entanglements in the natural environment. The results indicate that open-ended materials within nature invited and sustained curiosity and creativity. Children tended to gravitate to the complexity and ambiguity offered within the natural environment. The research findings have implications for educators, namely the importance of the choice of materials and approaches to support and prioritize children's curiosity and creativity in learning processes. Implications for inviting educators to capitalize upon inquiry moments and the unknown were also evident.

Keywords:

Creativity, Curiosity, Outdoor Learning, Forest School, Pedagogy

Introduction

Sam[1] , an 8-year-old child states, "we're trying to find cool things in the forest so we can videotape it and see if anyone knows what it is. So that's what we did with the fur we found in the video" (Video Data Transcript).

Sam is engaging in a video-stimulated recall dialogue (VSRD)[2] (Morgan, 2007) with a researcher as part of a larger comprehensive case study (Yin, 2009) of children's experiences in a Forest School[3]. The children of this Forest School program range in age from 6 to 14 years and attend an immersive program in a natural wooded area in the Niagara region of Ontario. At the time of the data collection of the study (2020-2021), this program was considered

an alternative to public school programs and was attended by children on a full-time basis. The outdoor nature program's approach was comprehensive. It included daily explicit language and math instruction as well as all other provincial curriculum expectations embedded within the approach of nature explorations of the children and educators. The program self-described itself as an "innovative, project-based, child-led program" (Nature School Website). The Forest School program was delivered by three educators, two of whom were full-time Ontario-certified teachers with extensive knowledge of Forest School pedagogy[4]. The third educator was a first-year pre-service teacher education student. This third educator was also employed as a research assistant for the project and supported both the program and data collection one to two days each week.

Forest Schools align with a constructivist theoretical orientation of learning, whereby children construct knowledge through experiences with real-world learning in the outdoors (Coates & Pimlott-Wilson, 2019; Harris, 2017). Although somewhat contested, the Forest School approach upholds specific principles related to process-learning, unhurried child-directed experiences, immersion in outdoor natural spaces, and repeated contact with the natural environment (Leather, 2018; Müller et al., 2017; Waite & Goodenough, 2018). Barrable and Arvanitis (2018) discuss how participation in Forest Schools can be linked to children's development of autonomy, decision making, communication, and problem-solving skills, as well as a sense of competence and risk-taking, fostering an important sense of connectedness to others within the common world (Latour, 2005).

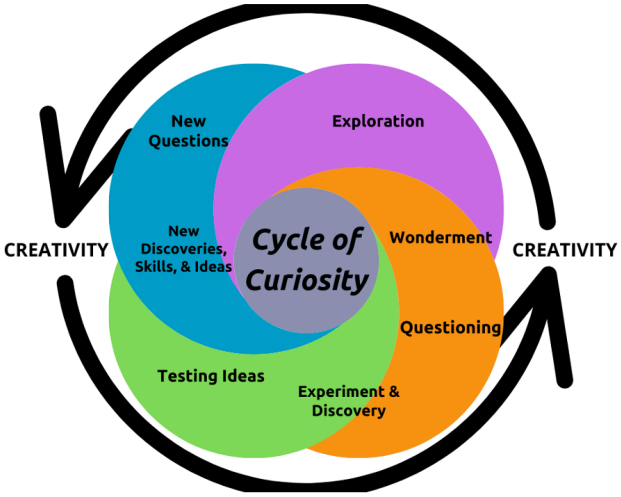
Specifically, in this paper, we re-examine data fragments from the case study to explore the nexus of curiosity and creativity in nature as two important caveats for learning. Purposefully, we aim to illuminate how learners, educators, and nature are entangled in a process of co-learning whereby children's cooperative or self-directed inquiries can help support more participative ways of knowing. Here, we focus on two thought provoking questions: 1) How does the forest invite children's curiosity and creativity? and 2) What would a relational-responsive pedagogy that prioritizes children's curiosity and creativity in a Forest School entail?

The Role of Curiosity and Creativity

Theoretically, curiosity and creativity appear closely linked. Curiosity "involves the pursuit of new knowledge and experiences" and creativity "involves transforming existing knowledge, ideas, or objects into something novel and interesting" (Gross et al., 2020, p. 77). Here, we think of curiosity as a cycle upon which children move seamlessly throughout various overlapping phases of exploration, wonderment, questioning, experimenting, discovery, repetition, and testing ideas leading to discoveries, new ideas, and skills, while also building confidence, and generating new questions and ideas. How curiosity and creativity are possibly linked is further discussed later in the article, here we present our conceptual model of the cycle of curiosity (adapted from Dietze & Kim, 2021) as intricately linked with creativity (Figure 1).

Figure 1

The Cycle of Curiosity and Creativity as Linked



Albeit not readily understood, curiosity seems innate and part of human cognition (Kidd & Hayden, 2015). Many scholars would argue young pre-linguistic children's relations and knowledge of the world are felt and experienced through their bodies and emotions (Gibson et al., 2017; Hodgkin, 1976, 1985; Ingold, 2021; Tuan, 1977). As Gurholt and Sanderud (2016) suggest for the child "the self and the environment are sensed, experienced and embodied relationally as coherent and meaningful entities or life-worlds" (p. 320). Hodgkin (1976) proposes that children are particularly curious about challenging, new, or difficult tasks. The young toddler is drawn to the unfamiliar and explores an acorn or blade of grass by looking, touching, tasting, and smelling. The older school-age child wonders and experiments with the force of the wind, perhaps using string, sticks, paper, materials, and their bodies to react and respond to the blustering movements of the wind. For children, much of this sense-making occurs through playful experimentation which can be defined broadly as any voluntary, self-directed activity that is spontaneous with imaginary and curious qualities (Dabaja, 2022; Gurholt, & Sanderud, 2016). It is through play that children's curiosities, discoveries, and questions are unleashed (Hodgkin, 1985). Children begin formulating questions at birth and as Hodgkin (1976, p. 21) emphasized, it is somewhat credulous that curiosity is apparent in children given the many constraints of formal education. Gurholt and Sanderud (2016) have described a distinct type of 'curious play' that unfolds for children in nature, viewing "life [as] a process of continuous creation of play-actions and

interactions, thoughts, and meanings, inextricably linked with the child's physical and socio-cultural surroundings and imagination" (p. 321).

How might curiosity and creativity be linked? Craft (2002) refers to creativity as "possibility thinking". Certainly, creativity and imagination are closely linked (Vygotsky, 2004) and are present in early childhood as young children begin to internalize language and thought. Throughout children's school years and into adolescence, creativity, and imagination "combines with conceptual thought and can reach its peak in adulthood through artistic, scientific and technological innovation" (Johnson & Watts, 2018, p. 4).

From a 21st Century perspective, creativity can be viewed as central to the inventive and flexible thinking needed for the "innovation economy"; particularly important are dispositions such as "learning to learn, readiness to collaborate, seeing from multiple perspectives, initiative, persistence, and curiosity" (Patston, 2016, p. 21). The school curriculum of Scotland (2013) equates creativity with the 'successful learner' emphasizing the importance of curiosity, open-mindedness, imagination, and problem-solving. Similarly, in the Ontario Ministry of Education's (2016) policy document entitled, Towards Defining 21st Century Competencies for Ontario, curiosity, and creativity are prioritized as important 21st-century competencies that are foundational in supporting children's current and future success.

We propose that the outdoors (in our study a Forest School) may offer unique and complex affordances (Gibson, 1986) to support a pedagogy of relational attunement[5] where intuitive teaching is predicated in part upon children's curiosity, imaginations, and creativity. In this article, we re-examine data vignettes to focus on the creativity-nature nexus of one Forest School program. By querying school-age (6-12 years) children's experiences and relations with others[6] in the forest we explore the following: What sparks children's curiosity? How is curiosity sustained? What creativity processes are enacted? What understandings are fostered? And what intuitive approaches can educators embrace to engage more wholly with curiosity and creativity in the learning process? We aim to gain an in-depth understanding of the relationship between curiosity, creativity, and learning in a natural environment to help inform educators' praxis and better prepare educators for outdoor teaching.

Forest Schools

Although approaches and labels differ around the world (Power et al., 2015) generally a Forest School is considered a philosophical approach to teaching and learning in the outdoors. Originating from Scandinavia in the 1950s, the philosophy is predicated on the notion that children should spend extended time in nature learning through unhurried exploration and inquiry (Blackwell, 2005). Over the past several decades, the Forest School approach has been readily implemented in many parts of the world (Beams et al., 2020; Cumming & Nash, 2015; Galbraith & Lancaster, 2020; Kemp, 2020; Maynard et al., 2013; Nedovic & Morrissey, 2013; Ridgers et al., 2012) and more recently, within Canadian early years programs (Carruthers Den Hoed, 2014). The approach has become quite commonplace among the early learning educational communities (age 3-6) where a focus on holistic development, decision-making, risk-taking, communication, and collaboration skills align well with the Forest School ethos (Cummings & Nash, 2015; Maynard et al., 2013).

Much of the research attention has focused on the early years as many Forest School programs target preschool and kindergarten (ages 3-6 years). These studies have reported increases in motivation, concentration, confidence, knowledge of the natural environment, autonomy, and an awareness of others for preschool children (O'Brien & Murray, 2007; Sandseter, 2009). Longitudinal examinations of children who participated in a Forest School in the early years also report higher retention and success rates later in schooling, less occurrence of attention-deficit/behavioural disorders, less chance of obesity, greater cooperation with classmates, and positive psychological and emotional effects on children (Maynard et al., 2013; Nedovic & Morrissey, 2013; Ridgers, et al., 2012; Sandseter, 2009). Ridgers et al. (2012) studied children who participated in Forest School, and they found notable increases in social skill development, confidence when interacting with the natural world, greater understanding and interest in learning, and heightened motor and leadership skills. Furthermore, Kuo et al. (2019) found that when children were engaged in lessons in nature, versus traditional indoor lessons, there were statistically significant effects on children's engagement, concentration, and fewer redirections (where the educator needs to cue a child to refocus back on the task at hand). Educators also reported being able to teach for longer periods uninterrupted, spending half as much time redirecting children's attention and behaviour (Kuo et al., 2019). Despite these notable benefits, describing (and naming) outdoor pedagogies is fraught with confusion and misunderstandings and can be a barrier for many educators.

Pedagogies of Relational Attunement

We have opted to describe teaching and learning in the outdoors as a pedagogy of relational attunement[7]. Although this study was not focused on the educators explicitly, nor do we claim that the pedagogies enacted countered the "distorting effects of narrowly

conceived educational methods, theories, and practices that often disconnect teachers from what is important in teaching—the relational" (Foran et al., 2021, p. 21). Instead, we offer readers the invitation to consider pedagogies of relational attunement as an entry point into the lived experiences of children's worlds, whereby educators are engaged in "seeing, hearing, and feeling pedagogical significance in the moment, despite grasping at, or lacking the language to capture, their encounters with children and young people" (Foran et al., 2021, p. 22). Educators must remain intuitive, curious, playful, experimental, and wholly responsive to the 'becoming-with' possibilities of 'thing–matter–child' encounters (Tesar & Arndt, 2016). In the forest, pedagogies of relational attunement require educators who embrace paradoxes, relational complexities, improvisational co-learning, and teaching opportunities, as well as the capacity to affect and be affected by all others of the common world (ideas by theorists such as Haraway, Spinoza, Dewey). Like Stengel (2018) proposes the goal of education should be attunement:

> *Learning to listen, to attend carefully and relentlessly, to unexpected others ... is a single disposition that renders education what it can and must be: the interaction quite literally constituting (ethical) community (p. 27).*

Later, we discuss the implications of educators' relational attunement with children's creativity-nature nexus as one possible pedagogical entry point.

Methodology and Techniques

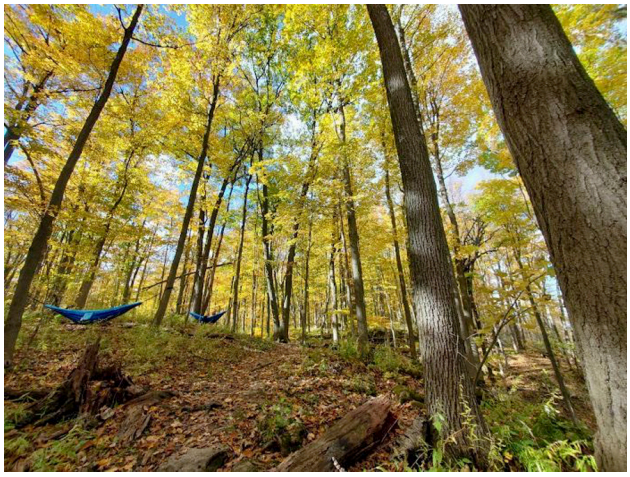
Given the need to closely examine the phenomenon of the Forest School experience, a case study methodology (Yin, 2009) informed by visual methods (Clark, 2010) framed the research project. The case study involved multiple sources of evidence collected between March and June of 2021[8]. Visual methods within case studies involving children are an important means of including children's voices and broadening understandings of their lives (Clark, 2010). Like Harwood and Collier (2019), GoPro videos were used as a data generation tool to help better understand the children's experiences. Additionally, the children's GoPro recordings were used as the basis of video-stimulated recall dialogues (VSRD) (Morgan, 2007). VSRD is a process where video clips (in this study chosen by the researcher) are used to stimulate dialogue and understanding between the child and interviewer. All data were transcribed and thematically analyzed (Smith & Firth, 2011).

The Forest Classroom

The outdoor spaces central to the children's daily explorations consisted of a forest, a field, and a natural creek. The Carolinian Forest on the edge of the Niagara Escarpment was marked with trails and signage that led children and educators to their home base, also known as the forest classroom (Figure 2). A clearing, under a lush canopy cover, provided space to set up materials educators transported to the site including hammocks, tools, rope, tarps, magnifying glasses, resource books, and more. A few fallen trees and natural rock formations offered opportunities for climbing or relaxing. This space was familiar and offered safety and comfort for the children to engage in exploration, play, and discovery.

Figure 2

The Forest Classroom



In addition to the forested area, a nearby creek and field were visited frequently (Figure 3). The creek was accessible by a passage through a field and ran alongside a hillside; both areas were home to many creatures and plant life.

Figure 3

Creek and Field Spaces

The Children and Educators

At the time of the data collection (and based on COVID-19 restrictions), all participants were children who attended the Forest School on a full-time basis. Seven school-age participants ranging in age from 6 to 12 years participated. Three educators, two full-time Ontario certified teachers and one part-time assistant teacher, interacted with the children regularly with two of the three accompanying the children on their explorations during the collection of the GoPro video data. The part-time assistant teacher was also a research assistant who was trained in collecting video data and conducting interviews.

Methods

Several methods of data collection were used throughout this study, namely observations, surveys, GoPro videos, pictures (from the GoPro cameras), and video-stimulated recall dialogues (VSRD). Here, we focus our discussion on the data associated with the GoPro videos and the VSRD. Before data collection began, the children were given a short introduction on how to use the GoPro cameras. Each day of data collection, all the children were invited to wear one of the two GoPro cameras for a portion of their exploration time. The GoPro camera wearer would then be responsible for operating the camera for a duration of time of their choosing, recording, and/or taking photographs based on their interests. Once a child was finished using the GoPro, they were instructed to return it to the teacher who would then offer it to another child to wear. The batteries tended to last one hour and would require switching by the educator. Thus, the maximum total video length in any one day was two hours. Children were reminded each day in the woods that wearing the camera was an option. During the four months of data collection, each child wore the camera at least once, with six children opting to wear the camera several times (the seventh child did not complete the school year resulting from COVID-19 complications). Once blurred images and corrupted videos were vetted and deleted, the data set for analysis included 97 artifacts, comprising 10 photographs and 87 videos.

Video Analysis

Children were asked to state their names at the beginning of their recordings for the researchers to identify and organize the video data. All video data was uploaded to password-protected cloud storage that was accessible only to members of the research team. Videos were examined regularly during the data collection period and weekly by members of the research team. The video data were analyzed thematically (Smith & Firth, 2011). Once videos were transcribed via a process of notetaking[9], the field research assistant/educator conducted the first level of interpretation of the video given this individual was in the field both observing and collecting data. A second research assistant (the second author) completed second-level coding. The first and third authors contributed to the process by reviewing and partially coding video data. The analysis resulted in several codes being agreed upon by the research team, namely, significant understanding of the topic, concept knowledge, misunderstandings, connections to nature, connection to the world, elements of play (i.e., attunement play, object play, body play, social play, pretend, storytelling, and creative play[10]) fantasy, inventive thinking, and imagination. Several of these codes were collapsed into the theme of curiosity and creativity.

VSRD

Video-stimulated recall dialogues are beneficial to ensuring children's voices and meanings are included within research and credited as the most knowledgeable individuals about their own lives (Mayall, 2000; Clark, 2010). The process involves a participant being "shown a video of an interaction that they have taken part in and when prompted by the researcher to reflect on their role within it" (Haw & Hadfield, 2011, p. 55). Similar to the evidence of video-interviewing among elementary students (Schneps & Libarkin, 2017), VSRD has been increasingly impactful within early childhood educational research queries (e.g., Määttä et al., 2016; Myrtil et al., 2021). And given that the method can be perspicacious when exploring social settings identified as "complex, interactive contexts characterised by novelty, uncertainty and non-deliberative behaviour" (Lyle, 2003, p. 861-862), VSRD was well suited for gaining insight into children's experiences in a Forest School.

Video clips from the children's self-recorded GoPro videos were chosen as the focus of the stimuli for the interviews. Each video clip was selected based on the child's active engagement within the natural environment. Typically, a researcher would sit side-by-side with the child participant and watch the video as often as the child wished, prompting questioning and dialogue more conversationally. Seven children participated in the video-simulated recall dialogues. Six of the children experienced VSRD in person with one additional child interview occurring over Zoom (COVID-19 disrupted some planned research procedures). All interviews were recorded and transcribed immediately following the interviews. Typically, each child requested to watch their videos twice. Question prompts used during the VSRD included:

1. Tell me about this video. What were you doing?

2. Why did you choose to take this video?

3. Why did you want to explore or investigate this aspect?

4. Tell me what you know about it.

5. What are you planning to do next in the video?

Analysis of the VSRD data followed the same process detailed above. The data set associated with the project is vast, thus we have carefully selected two vignettes (described below as the glass world and wonder with the hill) to highlight the nexus of creativity and curiosity within the pursuit of learning within a Forest school model.

Emerging Ideas

Children's imaginations and curiosities were consistently provoked within the natural environment. Nature provided inviting and open-ended materials that lent themselves to curiosity and creativity. Items such as pieces of fur, holes in the ground, rocks, water, animal tracks, and more piqued children's interest and invite exploration, wonderment, and experimentation.

The forest itself varied in landscapes and various features offered a plethora of invitations for exploration and wonderment (Figure 4). Interestingly, not all the features the children explored in the woods were natural elements with rusted car parts, cement culverts, bridges, garbage, glass, and various debris found in the woods also provoked the children's interests. Below, we showcase two slices of data to illustrate how being with nature in a relational way might offer new ways of teaching and learning (Warden, 2022).

Figure 4

Varied Landscapes in the Woods

The Glass World

> *"This forest is amazing; we went on a detour to glass world and we loved it!"*
>
> *Elisha's GoPro Video May 5th*

A rocky area in the forest shows signs of human encounters, broken glass, rusted machinery, and remnants of a firepit. The area is also covered with a plethora of broken glass (i.e., garbage) and has been dubbed the 'glass world' by the children (Figure 5). Although not an area the children could always explore freely, it appeared to intrigue and provoke children's imaginations. Who was here? Why did they leave it this way? What about the animals that live here? What should we do? The children wrestle with complex ideas and notions about their role within the woods. Simultaneously, the place invites 'magical' thinking and serves as a landmark to navigate the woods somewhat independently. The children know that from the glass world they must return to 'base camp' following a certain pathway. The glass world is referenced in conversations and ideas about space, time, and roles. Their familiarity and reverie for the glass world also highlight the discovery possibilities and hint at the confidence the discovery presents to generate new questions and ideas. The glass world is a reminder of the entangled ways in which humans are part of nature and the many tensions that outdoor teaching and learning can present.

Figure 5

The Glass World

Wonder with the Hill

Wonder with the hill is depicted in Figure 6 where children's bodies explore and entangle fully with the hill's dirt, rocks, roots, and angle. The dirt and hill are an invitation to explore, wonder, experiment, and test out ideas.

> *Extra rocks placed by the children onto the hill slow their descent whereas more dirt tossed provides the children with the sense they are going faster. The two*

> *children once at the bottom navigate to the top of the hill using trees along the way to anchor and propel themselves upwards. Small saplings bend and strain from the children's grasp and they quickly anchor themselves to larger trees and propel themselves upwards. The small child at the top pushes along the dirt a few centimetres with their hands, eyeing the other children, and evaluating his own decision to slide or not slide (Researcher Notes, Transcribed Video-June 1, 2021).*

In this instance of playful engagement, children are toying with concepts of gravity, mass, and acceleration. Most importantly the learning experiences appear to be interdisciplinary, exploratory, flexible, open-ended, experiential, and meaningful for the children. Here, the landscape invites opportunities for exploring and testing ideas. In this instance, the educator is off camera, but nearby, presumably satisfied with the co-constructed learning that is happening between the children themselves.

Figure 6
Full Body Creativity

Both curiosity and creativity were evident within the sustained learning in the forest and repeated visits to favoured and familiar spaces within the forest (e.g., the creek, glass world, and familiar paths). Children's experiments were also relentless. Natural materials in the forest were available for the children to fully experience and explore, often combining the open-ended materials in creative and novel ways. Each aspect of the cycle of curiosity was nurtured by children's relations with nature, fostering and supporting creativity in their play, thinking, and actions.

Implications

> *"We learn best as teachers, we teach best as learners" (Hodgkin, 1976, p. 3).*

The study yields important implications on the potential significance of curiosity and creativity in the learning process. The role of nature as a caveat for learning seems evident, but clearly, additional research is needed. Utilizing the interrelations present in all aspects of the natural world (including the child) and recognizing the dynamism, flux, and movement that is ever-present in what Ingold labelled as 'meshwork' (Ingold, 2021), ways of being with nature can be fostered. For educators (both in-service and pre-service), this implies a need for shifts in thinking about the static nature of the curriculum and how learning experiences are designed.

Although not fully explored in this study, the study also hints at the relationship between creative learning and teaching and the importance of learning experiences that are interdisciplinary, exploratory, flexible, open-ended, experiential, and meaningful to children. The children of this study benefitted from the opportunities inherent within the creativity-nature nexus of the forest. Thus, we foresee a need for educators to be relational and attuned to this nexus as one important pedagogical entry point for designing learning experiences. By paying attention to children's questions, curiosities, and intra-actions within a space, new avenues for teaching and learning will be provoked.

Suggestions for preparing educators for a creative teaching approach are implicated. Most importantly learning experiences should be designed to support interdisciplinary, exploratory, flexible, open-ended, experiential, and based on meaningful and relational experiences for children, with an ethos of being with nature (Warden, 2022). We encourage educators to value the outdoors and nature in an integrated way, allow time for curiosity and creativity to flourish, and ensure children have access to repeated experiences as well as ample time to engage and collaborate in whole-body learning that focuses on their self-directed queries.

Footnotes

1. All participants' names are pseudonyms.
2. See methodology section for a full description of VSRD.
3. Forest Schools around the world have varied names, depending on the context. For example, the approach is referred to as Bush Kindy in many places in Australia, udeskole in Denmark, and enviroschools in New Zealand.
4. The teachers were guided by the forest and nature pedagogical principles set out by Child & Nature Alliance of Canada.
5. Here we invite educators to think of relational attunement as a relational-responsive pedagogy which resists discrete and concrete categorization, instead moving "toward a more intuitive approach charged with seeing, hearing, feeling more wholly" (Fuscher as cited in Blades & Bester, 2014, p. 5).

6. Here, we include both humans and nonhumans as equally important and consider all matter as essential sentient and agentic (Haraway, 2016).

7. Like others (Blades & Bester, 2014; Fuchser, 2006; Stengel, 2018) we extend the notion of relational attunement beyond the child's relationships with educators or other children and consider the primacy role of materials, flora, and fauna within the web of relations.

8. Although planned as a yearlong study from September to June, COVID-19 negatively impacted the operation of the Forest School and constrained many of the planned methods of research.

9. Transcribing GoPro videos is a challenging task given the constant movement of the camera and video captures that do not include dialogue. Thus, the 2nd author created summaries of the video contents and researcher notes to help guide the analysis process. These summaries were verified by the first and third authors.

10. These broad-based patterns of play are defined by the National Institute of Play http://www.nifplay.org/science/pattern-play/

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