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# Learning with Wide-Open Eyes: Nudging at Perceived Barriers to Outdoor Learning within a Kindergarten

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## Abstract

*This article presents an in-depth case study of one kindergarten class in northern Ontario, Canada, and the ways that educators nurtured learners' curiosity in the outdoors. Documentation of learning, including photographs, quotes, and artifacts, served as the key source for reflection by educators, both the kindergarten team (teacher and early childhood educator) and those who partnered alongside them. Families were invited to share their experiences through an anonymous open-ended survey. This article discusses three perceived barriers to learning in the outdoors and the ways that participants noticed, named, and nudged at them for the benefit of the learners.*

**Keywords:** inquiry-based learning, barriers, outdoor learning, kindergarten, case study, Ontario

> *They run, jump, hop, skip, dodge all on their own. They look at their learning area differently and appreciate the freedom and take in all this learning with wide-open eyes* (Family Survey response).

Having a genuine relationship with the natural world has long been argued to be integral to our wellness and hinges on our capacity to live in a mutually respectful, balanced way (Steele, 2011; Steele, Hives & Scott, 2016). In this article, we consider what it looks like in practice to nurture a curious and sustainable relationship with nature within a case study of one kindergarten classroom in northern Ontario, Canada.[1] Multiple data sources were used to build the case, most notably the use of documentation of the children's learning (photographs, quotes, and artifacts) (see Wien, 2013), as well as input from individuals who contributed to the larger classroom community, as inspiration for pedagogical conversations.

In Ontario, Canada, children are valued as "competent, capable of complex thinking, curious, and rich in potential" (Ontario Ministry of Education, 2014, p. 6). The Kindergarten Program (Ontario Ministry of Education, 2016) for Ontario asserts that a greater sense of well-being can lead to children who are "more likely to engage in healthy and fulfilling social behaviors; more likely to invest in their own and others' well-being and in the sustainability of the planet as they take up their social, professional and leadership roles in adulthood" (Awartani, Whitman, & Gordon, 2008, p. 54). Beyond Ontario, the United Nations (1989) Convention of the Rights of the Child includes learning in the outdoors as a right of childhood, a further foundation for our study.

Our findings highlight three perceived barriers to outdoor learning central to this case study: (1) preparedness; (2) concern for risk; and (3) unpredictability of inquiry-based learning. Most notable was how the educators, families and teacher candidates noticed and named barriers, while simultaneously describing ways to challenge or *nudge* against these perceived barriers for the benefit of the children. We hope these examples inspire ongoing conversation around the benefits of outdoor learning.

## Review of the Literature

Grounded in play-based learning within a culture of inquiry, the Kindergarten Program (Ontario Ministry of Education, 2016) set the curricular guidelines for our case study:

> *Play is an optimal context for enabling children to work out their ideas and theories and use what they already know to deepen their understanding and further their learning. Innately curious, children explore, manipulate, build, create, wonder, and ask questions naturally, moving through the world in what might be called an "inquiry stance"* (p. 18).

[1] In Ontario, kindergarten is a two-year program beginning the year a child turns 4 (by December). A kindergarten teacher and a Registered Early Childhood Educator partner together as an educator team when the class size is greater than 15.

The kindergarten team in this study demonstrated a love for both inquiry and the outdoors as they sought to "adopt an inquiry stance along with the children" (Ontario Ministry of Education, 2016, p. 18), aiming to create the conditions for responsive teaching and learning that builds on children's interests, makes thinking visible and fosters engagement (Fraser, 2012). The kindergarten team also intentionally selected materials to be used for exploration and meaning-making (Callaghan, 2013).

When it comes to the learning environment, Heard and McDonough (2009) highlight the importance of giving children "the opportunity for wonder, mystery and discovery; an environment that speaks to young children's inherent curiosity and innate yearning for exploration" (p. 8). The Kindergarten Program (Ontario Ministry of Education, 2016) extends this importance to the outdoors as well. Thus, learning through play and inquiry in the outdoors becomes a natural extension of the classroom; an organic and ever-changing context where children work out and test theories as they explore the world around them (e.g., noticing, exploring, and talking about their theories of how water changes state as weather changes)[2] in meaningful ways. Generally, in Ontario, outdoor time may include a block of time connected with arrival, two outdoor nutrition breaks[3] or recesses, and/or a dedicated block of time leading to the end of the day (especially in winter when dressing requires extra effort). From our experience, Ontario kindergarteners are typically engaged in outdoor learning for at least 60 to 90 minutes each day.

Broadly defined, outdoor learning draws on similar components to inquiry, such as "discovery, experimentation, learning about and connecting to the natural world, and engaging in environmental and adventure activities" (Institute for Outdoor Learning, 2020, n.p.). Whole-body engagement in relationship with the environment fosters "the transformation of knowledge, skills, attitudes and behaviours," ultimately benefiting self, families, communities, and the earth we share (Institute for Outdoor Learning, 2020, n.p.). The benefits of outdoor learning for children, both active play and beyond, are well documented, including effects on wellness and well-being (see Coe, 2016). Kemple, Oh, Kenney and Smith-Bonahue (2016) note the ways that outdoor play supports healthy development in a variety of areas, including health and physical development, self-regulation and attention, communication and social development, and cognitive development. This goal for healthy development is supported by the 2015 Position Statement on Active Outdoor Play (see Tremblay et al., 2015), which brought together Canadian experts to respond to ongoing conversation around benefits and harms of outdoor play, and concludes that "access to active play in nature and outdoors—with its risks—is essential for healthy child development" (p. 1). The benefits of risky play are supported by Brussoni, Olsen, Pike and Sleet (2012). The position statement

[2] The Ontario Kindergarten Program (Ontario Ministry of Education, 2016) includes four overarching frames, one of which is Problem Solving and Innovating. In this frame, children are "making meaning of their world by asking questions, testing theories, solving problems, and engaging in creative and analytical thinking" (p. 15). See https://www.ontario.ca/document/kindergarten-program-2016 for further details.

[3] In Canada, some schools offer a balanced day with a morning and afternoon break rather than a traditional lunch with a short morning and afternoon recess.

recommends increased self-directed outdoor play opportunities "in all settings—at home, at school, in child care, the community and nature" (p. 1). The recent COVID-19 global pandemic has heightened the importance of the outdoors as a learning context for children (see the Lawson Foundation's (2020) statement on *Increasing Outdoor Play in Early Learning and Childcare in the Context of COVID-19,* and Coyle and Boder's (2020) *Guide to Advocating for Outdoor Classrooms in Corona-Era School Reopening*).

Despite what appear to be overwhelming reasons to implement outdoor learning as part of the learning day (Coe, 2016; Council for Learning Outside the Classroom, 2009), researchers have identified common barriers to such initiatives. For example, funding (transportation, resources, and staffing), time (extra preparation time and time in a crowded curriculum), concern for health and safety, concern for inclement weather, and lack of teacher expertise (Dyment, 2005; Ernst, 2014; Ernst & Tornabene, 2012; Sink & Boyes, 2006; Waite, 2009) are noted as common barriers to formal outdoor learning. "Safety and ease of disinfecting" often take priority over promoting exploration (Callaghan, 2013, p. 2). Kemple et al. (2016) also noted that "many early childhood educators are often unaware of the importance of outdoor play and lack strategies to support outdoor play and promote children's interactions with nature" (p. 451). Other barriers that have been noted in the literature include the perception that environmental education topics are "too depressing and scary for young children and that environmental sustainability is too abstract" for this age group (Samuelsson & Kaga, 2008 as cited in Ernst & Tornabene, 2012, p. 646). Kalpogianni (2019), states "the escalation of screen-based entertainment, as well as an increased focus on the acquisition of academics [sic] skills in the early years possibly inhibit the use of the outdoors for learning" (p. 156).

Through the research presented here, we sought to better understand the barriers perceived and experienced by a kindergarten community, as well as strategies to support outdoor learning. Coe (2016) proposed a shift from "excuses to encouragements" as a "pedagogical and problem-solving exercise for educators" (p. 12) to help confront barriers and concerns related to outdoor learning. The encouragements shared by Coe (2016, pp. 8-10) include:

1. "*One does not need a forest to learn about, through, and with nature. Nature is everywhere, and comes in all shapes and sizes.*
2. *One does not need to be an expert, environmentalist, or naturalist to support outdoor learning. Learning comes with and through engagement with the natural world and from each other*.
3. *The curriculum does not need to be delivered indoors. Children can and do learn outdoors.*"

Coe expresses "the need for contemporary Canadian schools to provide children with the opportunity to learn from and in the natural world" (p. 12). We believe this case study demonstrates how a kindergarten team focused on the idea of encouragements as they sought possibilities over limitations, adding further "support and encouragement to educators who are implementing or seeking to

integrate outdoor learning into everyday practice" (Coe, 2016, p. 5), both in Canada and abroad.

## Case Study Overview

The methodology used was qualitative in nature, taking a case study approach (Dyson & Genishi, 2005) to evaluate the "case" of one kindergarten classroom. Our research question focused on the ways in which educators' decisions intentionally nurtured children's curiosity in the outdoors in this one kindergarten classroom. A secondary question that arose during the analysis stage focused on barriers to outdoor education and how these barriers might be addressed.

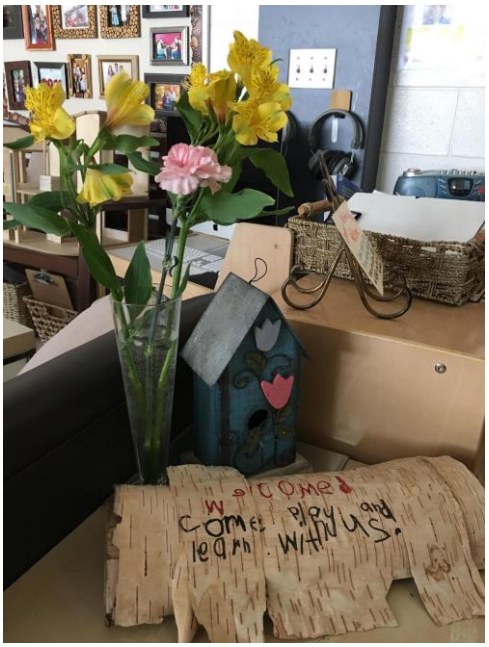
### Context

The kindergarten classroom studied was set within a publicly funded kindergarten-to-grade 6 elementary school, situated on an escarpment overlooking a city with a large and varied outdoor landscape, including a neighboring conservation authority/ski hill, all of which offer an inviting context for outdoor learning opportunities throughout the year. It is also the context where Lotje, our co-author, was the kindergarten teacher during the case study period, from September 2017 to March 2018. Prior to this teaching assignment, Lotje had taught for more than 25 years, mostly in kindergarten, but also held program leadership roles at the School Board level and Ontario Ministry of Education. No matter her role, the importance of learning actively in the outdoors for student success and well-being, as well as learning in relationship with the environment through inquiry, has been foundational to her teaching, learning and leadership.

Upon entering this classroom, the inclusion of natural and organic materials was evident, and visitors were invited to "come play and learn with us" (Figure 1). For this classroom, the outdoors was a natural extension of the learning environment. The classroom's exterior door led to a large open yard with sand, stone, grass, incline hills, a path, and stairs, as well as a small, wooded area, paved space, and open field. Open-ended, moveable materials also called loose parts (Flannigan & Dietze, 2017) were accessible to the children and stored in a shed. The learning day began outdoors prior to children gradually entering the classroom.[4] Opportunities for extended learning through inquiry in the outdoors occurred in the middle or at the end of the day. On occasion, the kindergarten children paired with Learning Buddies in older grades for a variety of shared learning opportunities, including nature walks into the conservation area beside the school. Educators observed, documented, and offered questions to extend and challenge the children's thinking and learning, which was shared back with both the children and families (e.g., displayed on a Smartboard in the classroom and shared on an online platform). The documentation contributed to provocations or invitations for further thinking that often led to building, creating, designing, writing, reading, researching, and integrating meaningful math opportunities.

[4] Entry was flexible to support individual growth and development.

**Figure 1**. **Invitation to learn together**




**Research Methods**

To build this case study, we drew upon multiple methods, including: (1) collection of documentation, (2) Documentation Discussion Circle (DDC), (3) family survey, and (4) teacher candidate questions. We began by requesting permission from parents to collect documentation. As described by Stacey (2018), documentation is "a gold mine of precious information—data—about the work and thinking of teachers and children as they collaborated in the classroom" (p. 132). Documentation includes educator observations of what children are saying, doing and representing (Ontario Ministry of Education, 2016) through "photographs of learning in progress, quotes, and artifacts of children's learning (Seitz, 2008). We specifically requested permission to study documentation from September 2017 to March 2018 that had been shared on Remind (a digital app for communication of learning with families) as well as documentation that had been displayed in the classroom. Lotje identified all pieces of documentation involving learning in the outdoors. An overview of the learning experiences displayed within the documentation we studied can be found in Table 1.

We then held a two-hour, audio-recorded Documentation Discussion Circle in August 2018 where the documentation was projected as inspiration for pedagogical conversations. Participants in the DDC included the kindergarten team, composed of co-educators Lotje (teacher) and Sarah (designated Early Childhood Educator), along with partnering educators, Laura (grade 2 teacher) and Christine (grade 3/4 teacher) whose classes joined with the kindergarten team's class for Learning Buddies. We asked the educators to consider three open-ended questions to invite conversation as they viewed the documentation: *What stands out to you as you look back at these moments? Why does it stand out? What does this mean when you consider the role of the outdoors in learning?* The conversation evolved

organically as educators viewed the documentation and considered the learning that took place.

**Table 1. Overview of learning experiences within the documentation collected**

| Outdoor Learning Experiences | Within Classroom Experiences |
|---|---|
| • reading under trees<br>• sketching trees in quiet observation spots<br>• shadow play to explore time passing<br>• hatching/releasing Monarch butterfly<br>• demonstrating how Nature recycles naturally - e.g., log in the classroom, sunflower<br>• scavenger hunt with Nature Buddies<br>• snow play, snow & ice safety<br>• discovering tracks in the snow; track walk<br>• celebrating water with Earth Buddies<br>• discovery walks to explore changes and notice patterns (weather, animal behaviors, plants) through cycles of the seasons | • mapping places around the world that have meaning to children and their families<br>• natural, found, and re-purposed materials in Art Studio and for creative design<br>• using senses to experience different squash in the Fall (survey and graph)<br>• painting inspired by natural materials<br>• designing athletic figures using "beautiful stuff" (Topal & Gandini, 1999)<br>• melting snow provocation<br>• designing & posting water posters<br>• collecting nature materials with Nature Buddies and co-creating an I Spy Nature word poster |
| **Materials & Loose Parts** | **Community Experiences** |
| • reused cardboard boxes, tubes, sticks, reused containers and other materials as loose parts for play (see Flannigan & Dietze, 2017)<br>• writing clipboards for observations<br>• toboggans and shovels for snow play & building<br>• snowshoes (animal adaptation) | • "Growing with the Biosphere" - poster offering free experiences for families (e.g., seed starting)<br>• "Discovering the Wonders of Nature" - a poster about ways for families to engage children in discovering nature: http://www.childrensoutdoorcharter.ca |

We invited the kindergarteners' families (n=28) to share their experiences regarding the outdoor learning experiences that had taken place by responding to an anonymous, open-ended survey (digital or hard copy). Fourteen family surveys were received, some of which were completed by two or more family members (including the child). In addition, as witnesses to Lotje and Sarah's goals for learning/teaching, Anne and Vanessa, two teacher candidates (in their second year of a two-year Bachelor of Education program) who had joined the kindergarten community as volunteers and for practicum, were also invited to respond to several open-ended questions via email about their experiences.

**Data Sources and Analysis**

Overall data sources resulting from the multiple methods included: documentation of learning (80+ photographs with narratives and artifacts of children's thinking); DDC transcript (50+ pages); survey responses (14); and teacher candidate responses (2). Most names are pseudonyms unless otherwise stated by the educator. Our analysis process was iterative, drawing on the constant comparative method and involved: (1) categorizing responses to the family and teacher candidate surveys in order to consider benefits, concerns and ways that families and teacher candidates viewed outdoor learning; (2) individual and shared reading/re-reading of the transcript in relation to the documentation to highlight emerging themes; (3) broader exploration of perceived barriers and ways to address barriers across all data, which led us to uncover the ways educators were noticing and naming barriers, but also nudging against them; (4) in-depth conversations about how this one classroom nurtured curiosity in the outdoors, including ways to support policy and programming.

In this article, *noticing* refers to observing patterns in behavior closely and with intentionality. *Naming* refers to recognizing and identifying or describing what is being noticed to pay closer attention to it with purpose.[5] While the term *nudging* has many definitions, we intend it to mean a way to "coax or gently encourage (someone) to do something."[6] For us, "nudging" is about responding to the noticed and named barriers by challenging the status quo and looking beyond the assumptions of a barrier as a stopping point, and instead, challenging the limits of what is perceived as a barrier to offer suggestions, strategies, and resources.

## Findings: Noticing, Naming and Nudging Perceived Barriers

Barriers mentioned earlier in the review of literature (time in the curriculum, concern for health and safety, weather, appropriate resources, and teacher expertise) resonated throughout this research project. In this section, we bring to light three perceived barriers that were central for this kindergarten community: (1) preparedness (all weather/all seasons); (2) concern for risk; and (3) the unpredictability of inquiry-based learning. Table 2 provides a summary of each perceived barrier. For each barrier, we outline examples of the ways participants noticed and named the barrier, as well as nudged at it within a kindergarten context.

[5] The terms "noticing and naming" are often used by educators in conjunction with The Kindergarten Program (Ontario Ministry of Education, 2016) and Growing Success - The Kindergarten Addendum (2016) as educators seek to make children's learning visible. "Noticing and naming" aims to articulate what children are thinking and doing.

[6] https://www.encyclopedia.com/humanities/dictionaries-thesauruses-pictures-and-press-releases/nudge-0

**Table 2. Perceived barriers and nudges**

| |
|---|
| *Perceived Barrier*: Preparedness (all weather/all seasons)<br>*Ways to Nudge at this Barrier*:<br>● Communicate with families and engage in conversations with children<br>● Offer access to a range of materials<br>● Encourage professional dialogue around safety expectations |
| *Perceived Barrier:* Concern for Risk<br>*Ways to Nudge at this Barrier:*<br>● Prioritize respect for the environment as a way of being<br>● Recognize children as curious and competent in the outdoors<br>● Pair up with learners in older grades |
| *Perceived Barrier*: Unpredictability of Inquiry-based Learning<br>*Ways to Nudge at this Barrier*:<br>● Know the curriculum/know the environment<br>● Recognize the curriculum as integrated and living<br>● Recognize that outdoor learning enhances literacy connections<br>● Ask questions to deepen understandings<br>● Create opportunities for innovative thinking and problem solving |

**Barrier 1: Preparedness (All Weather/All Seasons)**
Only two of the 14 surveys spoke to concerns about learning in the outdoors, both related to preparedness for weather: "sun exposure without protection" and "bug bites that are potentially dangerous—ticks, vector mosquitoes." Christine, the grade 3/4 teacher, also mentioned preparedness in relation to comfort in the outdoors: "I brought my kids out under the trees to read, especially in the fall, and... spring, [learners] just brought in towels (for [those who] that don't like to sit in... dirt)." The experiences of our participants highlight three ways to nudge at concerns related to preparedness.

***Communicate with Families and Engage in Conversations with Children***
Christine talked about the importance of communicating with families: "I let them know that if it's drizzling, we're going to still go out into the trails and to bring an extra pair of socks, so that helps the communication piece." Building on this idea, Lotje shared: "We [the kindergarten team] were really intentional at the beginning of the year to let parents know we were going to be going outside every day." Through a Welcome Letter they offered the following invitation:

> *We encourage you to look at a weather app with your child and to talk with them about how they can be prepared for the day. This encourages your child to think and talk about how weather is always changing, and it fosters adaptability as an important life skill.*

During winter weather, Lotje explained "...we have real conversations with the children... we talk about what animals do and how they adapt [to winter

conditions].” These discussions encouraged the children to consider how to move carefully on the ice like different animals (Figure 2). One family noted the growing confidence that arose: “...[he] has become so confident ‘moving’ on different surfaces and being so comfortable on knowing what his body can do” (Family Survey).

**Figure 2. Managing icy conditions**

***Offer Access to a Range of Materials***

Vanessa, a teacher candidate, noticed the kindergarten team’s intentionality around materials that supported outdoor play and learning: “...[they] provided a variety of materials... snow shovels, toboggans, plastic bins and snowshoes for the children to use if and how they chose to.” These materials and other loose parts (logs, planks, tubes, buckets, blankets, clipboards, etc.) were stored in the classroom, as well as in a shed. Christine also spoke to proactive, practical strategies such as providing towels to sit on.

***Encourage Professional Dialogue around Safety Expectations***

The educators indicated a need to clarify traditional school “rules” with colleagues and administration—ones that had become generalized over time (e.g., no walking on the ice). Lotje recalled asking, “Can we still do this?” when challenging rules that imposed limitations that did not value children as capable (e.g., learning to walk carefully on ice). The educators recognized that administrative guidelines serve a broad audience and they believed it would be helpful to revisit expectations of learning outdoors seasonally with students, staff, and the parent community.

**Barrier 2: Concern for Risk**

Another barrier that arose during the Documentation Discussion Circle concerned outdoor safety beyond anticipating and being prepared for organic risks as discussed above. Instead, it focused on the potential for unsafe circumstances in response to unfamiliarity with learning in the outdoors. Laura, the grade 2 teacher, shared an experience which led her to feel hesitant to go outside and Christine responded, "... behavior can be an issue absolutely... because some of [the learners] are quite loud or they would run ahead...." Christine recognized that unfamiliarity might initiate concerning behaviors: "It's hard because they want to climb the trees... and [are rough] with sticks [and each other]... so management can be tricky...." She noticed however, that "once the novelty wore off... [the behavior] diminished a little bit."

A second aspect of this discussion focused on a photo of a child exploring a water drainage pipe on the side of the school building (Figure 3). Sarah, the early childhood educator, recognized how educators might perceive danger in this moment: "Other teachers might think 'maybe we shouldn't go near that, maybe we should do something else'." Recognizing the potential of risk indoors and out, one family offered: "We spend a lot of time outside ourselves, so he knows mostly how to stay safe. He is just as likely to hurt himself running around the gym as he is outside." To nudge at the barrier of behavior/risk, three considerations were offered by participants.

**Figure 3. Drainage rain pipe**

***Prioritize Respect for the Environment as a Way of Being***

Teaching respect and mindfulness in the outdoors was offered as one way to nudge at the barrier of behavior/risk. Lotje explained, "... if schools and child-care [prior to school] were helping the children [to] be mindful of living things and how to treat them... then by the time they come to an older class, it's a whole different way of being...." This purposeful teaching by the kindergarten team was recognized by

families. Often photographs of moments in nature noticed by the children were shared to encourage conversations about respect for living things (e.g., a sunflower with a pollinating bee and a butterfly drying its new wings). On the family surveys, one mother shared, "He has started to be very concerned about animals and bugs...." A father shared how his child was developing "...appreciation of the outdoors and a conscience about her actions in nature...." Another mother commented on how learning about the environment at school extended into what they were doing at home. She explained, "With warmer weather we have started hanging clothing out to dry, not [using] the dryer. We recycle our bottles, paper and cardboard."

***Recognize Children as Curious and Competent in the Outdoors***

The intentional sharing of specific learning moments with families through the Remind app invited conversation about children's curiosity and competence in the outdoors. Referring to Figure 3, Sarah shared how: "...it's nice to send pictures when children are in situations... where they are being curious... [the child] could explain and have this conversation with his family." According to the survey responses, families also recognized their children's growing capabilities outdoors, observing "(they are) more independent outside than before" and "He notices what is around him and will stop to look and observe... and share his thoughts with us." Teacher candidate Anne reflected, "(it is) important to treat the students as capable and provide a variety of different ways for the students to learn." Anne was beginning to see the learning that unfolded when children were viewed as capable and curious.

***Pair Up with Learners in Older Grades***

One practical suggestion was to partner younger and older learners. Lotje explained, "...having a learning buddy that's older, [asking] how we can grow this and invite other people into this experience... the [educator from the other classroom] is learning from you but you're learning together at the same time. You'll see your children in a different light." Christine added, "I wanted to provide leadership opportunities for my children...." Both Laura and Christine had engaged in Learning Buddies with this kindergarten class and spoke to the value of focused engagement and building community.

**Barrier 3: Unpredictability of Inquiry-Based Learning**

The final barrier was the unpredictability of play and inquiry-based learning. When it came to following children's interests, Laura offered, "...they might have knowledge that you don't have... or they might have a question that you can't answer." Lotje confirmed: "I wonder if that unpredictability can be a barrier or a challenge for some people because they are thinking 'ohh I'm not really sure what they are going to be curious about, where is this learning going to go?'" Christine agreed: "I do find it a little harder to be... 'let's go out and see what happens' because I have to teach them sometimes...." To nudge at the barrier of unpredictability of inquiry-based learning, five areas of consideration emerged.

***Know the Curriculum/Know the Environment***

As the DDC turned to questions of curriculum, Lotje offered, "...how do we help

people to come to that place of being okay with [being flexible and responsive]... it makes me think about knowing your curriculum so well that you see the connections, and also knowing your environment.... If it's winter time and there's ice, get a good sense of what's out there." Seeing potential in nature, Lotje commented on a photo of a child holding a three-dimensional object: "...you can use things from nature in so many different ways and there are no rules that you must use it this way" (Figure 4). During an "aha" moment, Laura exclaimed, "That was probably the biggest thing... the way the outdoors and the curriculum connected. And in a really subtle way. [Children] don't realize they are doing curriculum learning because it is stimulating, because it's connected to the outdoors." Recalling a water inquiry involving the use of a system of cardboard tubes to move a marble (representing water) from one place to another to demonstrate how countries can work together to make clean water accessible across the world (Figure 5), Laura commented, "...it opened up so many possibilities for learning... the awareness of conservation of water, the teamwork that had to go into achieving the goal...."

**Figure 4. Discovering three-dimensional figures in nature**

**Figure 5. Designing a continuous system of tubes**

***Recognize the Curriculum as Integrated and Living***

The barrier of unpredictability was also identified. Teacher candidate Vanessa reflected, "Learning experiences (outdoors) allowed the children to discover basic elements of science, math, art and literacy... some children discovered how they could use toboggans to make it easier to carry heavier items...." (Figure 6). Teacher candidate Anne observed, "It was interesting to see the students connect what they are learning in the classroom to what they were learning outdoors" (Figure 7). One family commented on the depth of understanding through integrated learning outdoors: "Kindergarten children are able to understand complex concepts regarding the environment including photosynthesis, weather patterns, tree seasonal cycles—AND are able to explain them in detail to transfer knowledge." Laura highlighted math and procedural writing examples that stood out to her. Supporting the idea that learning flows naturally in these moments, Lotje recapped, "[the] Curriculum is about learning... how to live in your world." She views curriculum not only as integrated but as living and dynamic, responsive to individual learners and offering opportunity for social development through learning.

**Figure 6. Using toboggans and shovels to make work easier**

**Figure 7. Recognizing math in the world**

***Recognize that Outdoor Learning Enhances Literacy Connections***

A specific focus on literacy opportunities was also evident across our groups of participants. One mother noticed the way these experiences supported oral language at home: "[my child] said it was fun and he has stories to tell." Christine similarly noticed, "they can generate ideas easily outside I find... then you can focus on other things in writing, in word choice and those sensory details and making your audience visualize...." Lotje added, "you are seeing a very natural way to inspire writing through being in the outdoors." Anne noticed opportunities for collaboration and multimodal literacy during the water inquiry: "We were able to collaborate with another class and they [older learners] created a video to capture the moment... how amazing it was to connect math, geography, and science to one experience... outside." As part of this same inquiry, with their grade 2 Learning Buddy partners, the kindergarteners found ways to inspire action by designing posters with powerful messaging and proudly hanging them throughout the school (Figures 8 and 9).

**Figure 8. Co-created message poster**

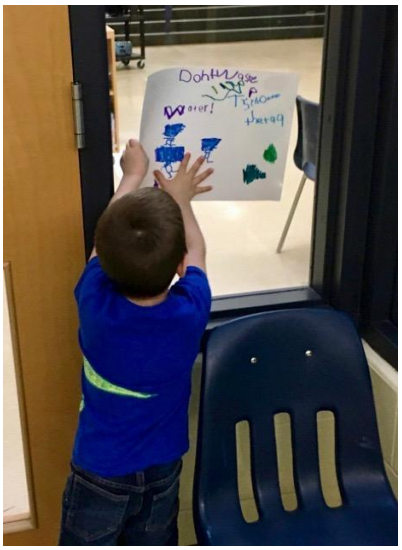


**Figure 9. Posting messages: "Don't Waste Water!"**

***Ask Questions to Deepen Understandings***

Perhaps not surprisingly, both teacher candidates were observant of strategies being used as they considered their future pedagogy as educators. Anne highlighted "the use of questions" to support learning. Vanessa expanded, "Any time you can use the environment as a teacher [e.g., use of materials, natural conditions] and support the organic learning opportunities that come from this through the use of 'noticing and naming' and questioning strategies, the stronger the learning outcome will be." Even as adults, Laura described the questions that surfaced when her flashlight shone upon the web of a busy spider while at her cottage one weekend. Laura spoke to how unexpected episodes such as this ignite responsive learning and teaching and how important it is that educators remain open to building onto these moments.

***Create Opportunities for Innovative Thinking and Problem Solving***

The water inquiry was prevalent in the documentation discussed by the educators. The kindergarten team shared how children first noticed and explored some pooling water in the yard, which led to a fascination with how the water made pathways and puddles, and included an opportunity to observe and speak with a surveyor visiting the school. Lotje explained: "...that's how the water [inquiry] all started... I [asked the surveyor] 'tell me about what you're doing, I've never seen this kind of tool before'.... [It was] a real problem... it's looking for where the math lives...." The discussion emphasized how capitalizing on unexpected situations provides an invitation for learners to apply their thinking, to innovate and problem-solve, and to use math to understand the world.

**A Lens Towards Nurturing Curiosity in the Outdoors**

The educators in this study took up a shared responsibility to promote play-rich opportunities and nurture curiosity in the outdoors. While a case study of one kindergarten community has limitations due to study size, nonetheless it creates an opportunity to deepen understanding of what is working for this one program. The community in this case, specifically the kindergarten team and partnering educators, alongside the children and families, noticed and named perceived barriers to learning in the outdoors, and in so doing, sought to work through or nudge at those barriers. Their story challenges educators, families, and policy makers to consciously and mindfully adopt a lens or position that informs actions. The lens towards outdoor learning that was taken up by this kindergarten team was multi-layered as demonstrated in the findings shared above, and included an ongoing effort to: (1) continually weigh risks with benefits; (2) create a shared responsibility for the environment with children; (3) foster healthy and active habits through positive outdoor experiences; (4) bring literacy and mathematics learning into the outdoors; (5) view children as capable beings within their world (e.g., storytellers, designers, authors, artists, scientists, mathematicians). Knowing the unique needs of their learners supported inclusive and responsive approaches to learning in the outdoors. These five considerations can help educators to nurture children's organic curiosity about nature, which "empowers children to contribute to their own learning" (Chiarotto, 2011, preface).

## Discussion

The notable way that participants nudged at perceived barriers is an indication of how they placed value on outdoor learning. Similar to Coe's (2016) third encouragement, our findings support how "curriculum does not need to be delivered indoors. Children can and do learn outdoors" (p. 10), and there is potential for enjoyment, engagement, social connection and growth for all learners.

Nudging against perceived barriers led this kindergarten team to model and discuss respect for the environment in a way that is fitting of Kemple et al.'s (2016) strategy of "noticing and maximizing teachable moments." For example, when considering the perceived barrier of risk, the educators spoke to valuing the perspectives of children and sought to challenge their thinking through the outdoors. A pedagogy of wonder became evident as the kindergarten team took time to notice student interests and theories to make room for learners to take a lead, share their expertise and grow in confidence (e.g., water inquiry). The educators nudged at the perspective that young children find environmental education too complex, a barrier noted by Samulesson and Kaga (2008). Academic skills did not take precedence over learning in the outdoors, a concern raised by Kalpogianni (2019), but were seamlessly integrated into the outdoor explorations and learning experiences. Knowingly nudging at the perceived barrier of unpredictability in relation to inquiry-based learning, educators saw their role as facilitators of opportunities for thinking, wondering, sharing knowledge, observing, documenting, and reflecting—all processes that are owned by the learner and unique to their experiences in relationship with the environment (Ontario Ministry of Education, 2013; 2012). The educators recognized the curriculum as integrated and living (indoors and out).

The kindergarten team found many ways throughout the seasons for outdoor learning that extended naturally to and from the classroom (see Table 1). The perceived barrier of preparedness was not just about the weather for these educators but nudged at how to offer access to a range of materials. While cost was not raised as a specific barrier, we noted the availability of "low-cost nature-based elements" (Kemple et al., 2016, p. 452) and access to outdoor spaces for learning that took into consideration accessibility for all children. The loose parts available to learners (inside and out) supported this ebb and flow as learners adapted to and changed their outdoor playscape to suit their purposes. Flannigan and Dietze (2017) studied the role of outdoor loose parts with preschool children and found they offered unique experiences with "opportunities for play, social interaction, language use, risk taking, and inclusivity of gender and age" (p. 58).

Regarding weather and climate, Kemple et al. (2016) observed, "All over the world, children play outdoors in dramatically different climates. With suitable apparel, and perhaps sun protection, an especially cold or hot day (or even precipitation) need not keep children from playing outdoors" (p. 452). The educators in this study demonstrated a similar positive attitude about weather and dirt (another one of Kemple and colleagues' strategies), offering specific examples of ways to support outdoor learning in a northern winter climate (e.g., how to walk safely in icy conditions, how to stay warm and/or dry). The educators communicated that

having conversations was paramount to addressing the perceived barrier of risk. Conversations offered a place to dispel myths and assumptions, reinforcing why learning actively outdoors is beneficial to the learners, and offering a forum to discuss proactive management and safety strategies. The kindergarten team's experience reflected a supportive administrator who was available for consultation, who had confidence in the kindergarten team and their learners, and who supported the team in working with families to ensure that the children would be prepared for the ever-changing outdoor conditions typical of a northern Ontario community. Although questions of inclusivity did not arise in the data, the educators spoke to the importance of knowing their learners and being responsive to their unique needs.

Unique to this study, educators' use of documentation to observe and communicate outdoor learning contributed to deepened understandings about why and how children learn in the outdoors. As indicated in the Ontario Kindergarten Program (2016), "A rich integrated curriculum, the kind that needs the reality of the outdoors, serves children well. When we serve children well, we predicate a better future" (Rivkin, 1995, p. 81). In listening to the educators, we found ourselves thinking deeply about how their efforts to nudge at perceived barriers can be transformative to early learning contexts faced with similar questions. Looking forward, we offer talking points for ongoing discussion. How might stakeholders within early learning:

- develop consistent messaging with respect to how children are viewed (e.g., "capable, competent, curious and rich in potential" (Ontario Ministry of Education, 2016))?
- target funding (including time, professional, resources, and research) to promote experiences in the outdoors that foster healthy and active habits for life and the sharing of these stories (via media and curricula)?
- introduce learners to the outdoors, perhaps through indoor activities related to the outdoors (see Table 1) so they are prepared for what to expect when learning outdoors?
- introduce management and teaching strategies so learners understand what is expected of them prior to going outdoors?
- take advantage of opportunities that build on children's interests and develop confidence in being outdoors (see Table 2)?

Across all contexts, we hope classrooms and programs will share their stories of progress and engage the wider community in deepening understandings about learning/teaching in relationship with the environment. Going forward, whether facilitating learning in person, virtual or a hybrid of both, this case study invites educators to be intentional in taking steps to design a new normal, shifting what we know from our own lived experiences, to how we want our world to be.

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