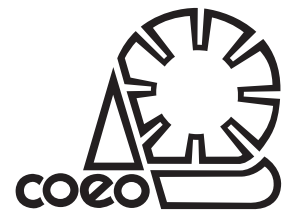


Pathways

THE ONTARIO JOURNAL OF
Spring 2024, 36(3)

OUTDOOR EDUCATION



Pathways

COEO

Formed in 1972, the Council of Outdoor Educators of Ontario (COEO) is a non-profit, volunteer-based organization that promotes safe, quality outdoor education experiences for people of all ages. We achieve this by publishing the *Pathways* journal, running an annual conference and regional workshops, maintaining a website, and working with kindred organizations as well as government agencies. Members of COEO receive a subscription to *Pathways*, as well as admittance to workshops, courses and conferences. A membership application form is included on the inside back cover of this issue of *Pathways*.

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Pathways

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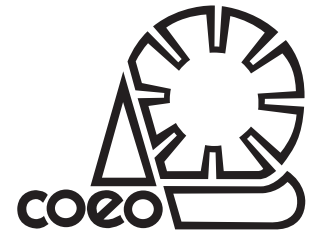
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We begin this issue of *Pathways* with an article entitled “Can I Really Teach an Additional Language Outdoors? Lessons from Outdoor Education, Reggio Emilia and Additional Language Learning”, by Sabrina Sessarego Michaluk. Sabrina’s research highlights the promotion of holistic language learning through the use of authentic outdoor settings. Along with the many benefits of spending time in nature, this author’s work also explores the value of experience and importance of joy in outdoor learning. Next, Denise Heppner and Tirzah Reilkoff reveal how “Teaching Science is Teaching Reading.” These authors demonstrate how supporting learners’ acquisition of background knowledge, through science-focused Forest School learning activities, has a positive impact on reading comprehension. We then hear from Simon Priest, who explains why OE practitioners should consider blending student “reflect and connect” nature experiences with “fight or flight” challenge

episodes in outdoor learning. Priest makes a strong argument for this integrated outdoor pedagogy, which alternates challenge and nature experiences, supporting both learners’ understanding of themselves and how to work with others, as well as having them develop a deep understanding of natural ecosystems and reciprocal human impacts.

What’s all the buzz about the Backed By Bees Hive program in Ontario? Perhaps you’ve spotted some of their bee hives placed atop your local shopping mall or school – Meadmaker, Vincent Sowa explains how this inventive educational partnership is reconnecting urban dwellers and students with the vital role pollinators play, all while encouraging responsibility and environmental stewardship. Following this, Adelle Purdham, writer, teacher, and parent disability advocate, muses about the role of fungi in our world, and the ephemeral and often fragile nature of mushrooms. Next, a new book is reviewed—educator and author Jacob Rodenburg shares his recommendation of *Outdoor Magic: The Power of Nature Connection* by Grant Linney. We conclude this issue of *Pathways* with “Why the Deer Spirit”. This piece by Armand Garnet Ruffo, an Anishinaabe writer from Treaty #9 territory in northern Ontario, is from his latest poetry collection entitled *The Dialogues: The Song of Francis Pegahmagabow*.

Kyle Clarke
Editor



Sketch Pad – The art for this issue of *Pathways* was generously contributed by Brooklin Stormie. Brooklin is an artist and illustrator with a passion for storytelling and public art. A grad of OCAD University’s illustration program, her current focus includes picture books, editorial work and graphic novels, as well as murals and community art initiatives. Brooklin enjoys exploring myth-making and community with her work.

Instagram: @brooklinstormie

My son Jasper has a recent affinity with the mourning dove that inhabits our backyard walnut tree. His daily inquiry and interest in this bird reminds me that for all children, there truly is magic in their local natural spaces and the changes of seasons we all experience. The rebirth of insects, return of migrating birds, regrowth of buds and blooms, running of the sap within trees, the endless mud and puddles to romp in...all are beautiful signs of spring that are natural teaching opportunities for our students. What elements of spring do you see your students engaging with most? I share my gratitude for your dedicated work as an outdoor educator to cultivate deeper connections to the natural world for our students across Ontario.

This spring, the COEO Board of Directors have been hard at work with several impactful projects as well as planning for our Fall 2024 Conference at RKY! This year, as a Board we have divided our efforts and energies into specific subcommittees; the Bursary and Grant Committee, the Connections Committee, the Awards Committee, the Past Perspectives Committee and the Membership Benefits Committee. Here are some updates from the committee leaders! The Bursary and Grant Committee is focused on ways to enable COEO to grow and develop as a networked and inclusive organization in multiple ways. To do this we are planning for means to develop and sustain a robust bursary fund and to determine ways to equitably and fairly allocate these funds in alignment with COEO goals and principles. The Connections Committee has been working on ways we can connect with each other at conferences and beyond. At our Fall Conference this year, we'll be trying out some new additions to name tags. The Awards Committee has created and sought input about a new inclusivity award, as well as worked to boost knowledge about annual awards and nomination processes. The Membership Committee is focused on reviewing the current benefits and their relevance to the COEO community and the outdoor education field. The committee is to ensure the continuity and quality of the benefits to enhance the member's experience. The Past Perspectives Committee is working to collect interviews with influential members from COEO's early days, focusing on relating their experiences of COEO and outdoor education in the past through a

semi-structured interview protocol, as well as brainstorming potential uses of the work for sharing with a more public audience.

I am thrilled to formally welcome you to Camp RKY for COEO's 51st annual Fall Conference September 20-22, 2024. Our Conference Committee is working diligently at organizing this special weekend and we hope to see you and your colleagues there! Our 2024 Fall Conference theme is "Speak Out: The Power of Words in Outdoor Education / Exprimez-Vous : Le Pouvoir des Mots dans L'Éducation en Plein Air." As we are located further east than normal for this conference, we are keen to welcome more French-speaking outdoor educators, and we also want to focus on bringing in Indigenous languages among other topics related to language. Call for presenters and registration are out now and we invite you to submit a workshop proposal and/or sign up to attend this cup-filling weekend at camp! We encourage you to bring a colleague that has never been to a COEO Conference before; we'd love to learn alongside them and make them feel warmly welcomed into this special community.

A dear friend to COEO, Elder Peter Schuler, once shared in a circle teaching with Bronte Creek Students and staff that embedded in the regrowth of spring is the flowing of sap, which represents the renewal of all living things around us. I recall "feeling felt" with this teaching; for me, spring brings feelings of emotional release and growth. His teaching stands as a reminder we are all so connected to the living world and diverse natural environments around us.

I hope you continue to let your love of being outdoors rub off on those around you. Our earth and communities need your facilitation skills to get kids (and adults too!) outside and more connected to our beautiful, yet unequivocally fragile, environment into the fabric of which we are all woven. Enjoy the giggles and smiles that spring puddle jumping and bird ID provide, as well as plenty of maple syrup tastings! Looking forward to seeing you September 20th at Camp RKY!

*Hilary Coburn
President*

Can I Really Teach an Additional Language Outdoors? Lessons from Outdoor Education, Reggio Emilia and Additional Language Learning

By Sabrina Sessarego Michaluk

Introduction

Our outdoor meeting space was located across a school field and in a grove of deciduous and coniferous trees. Week after week, on warm fall afternoons and cool, snowy mornings, my kindergarten class and I would trek there for our outdoor explorations. One particularly sunny day in October, we set out to collect and sort leaves according to size and colour in Spanish. Words like *grande* (big), *pequeño* (small), *rojo* (red) and *amarillo* (yellow) were quickly becoming part of the children's vocabulary. When we arrived at our spot, the children and I were amazed at the vast quantity of leaves that welcomed us. Soon we were all filling our arms with leaves and piling them up as high as we could. The children laughed and together, creating a circle around the humongous pile, we began to sing a fall song about colours in Spanish and English. The song ended with us jumping in the pile of leaves free of abandon. One of my students looked at me and said: "*Señora* (Mrs.), this is the best day of my life".

It's days like these when I see children smiling, playing and speaking in Spanish with confidence, that I am reminded of the importance of bridging children's love of nature with additional language learning.

Outdoor Education in Alberta Schools

Place-based learning, where students explore social and ecological narratives of their community (Gruenewald, 2003), land-based learning, focused on traditional ecological knowledge of Indigenous peoples (Bowra et al., 2021), and outdoor education have become common vocabulary among educators in school boards across Alberta (CASS, n.d.). Outdoor education can be defined broadly as "lessons that are generally taught in a classroom [that] occur

in the outdoors [and where]...children learn in authentic surroundings" (Lloyd et al., 2018, p. 163). Outdoor learning can take on many forms in Alberta school settings, such as single-day field trips to natural parks, in-school environmental education field trips and overnight trips to outdoor camps. Outdoor education can also be interpreted as daily/weekly visits to natural spaces near or on school grounds, school gardens or outdoor classrooms.

Outdoor environments offer students a variety of sensory experiences, opportunities for collaboration and a space for students to ask questions and share experiences (Ceccon, 2021). As anyone who has participated in outdoor learning may attest to, there are many documented benefits to spending time outdoors for both students and teachers, such as improved creativity, physical and mental health (Scott et al., 2022). The "outdoors" is a setting that is "not only based on its physical characteristics, but also [based] on individual experiences" (Straker, 2008, p.112) that promotes learning through Experiential Learning Theory (ELT) (Kolb, 1984). According to ELT, all learning begins through the senses in the experiencing stage and afterwards, one reflects on their experiences and feelings. Learners then move to the thinking stage where conclusions and generalizations are made. Finally, in the acting stage, the learner applies their conclusions to new experiences (Institute for Experiential Learning, n.d.).

Experiential Learning in an Additional Language Setting

According to Dodman et al. (2022), experiential learning is a concept that is also recognized in the field of additional language acquisition, where students are engaged in the learning process through projects that are student-centered and

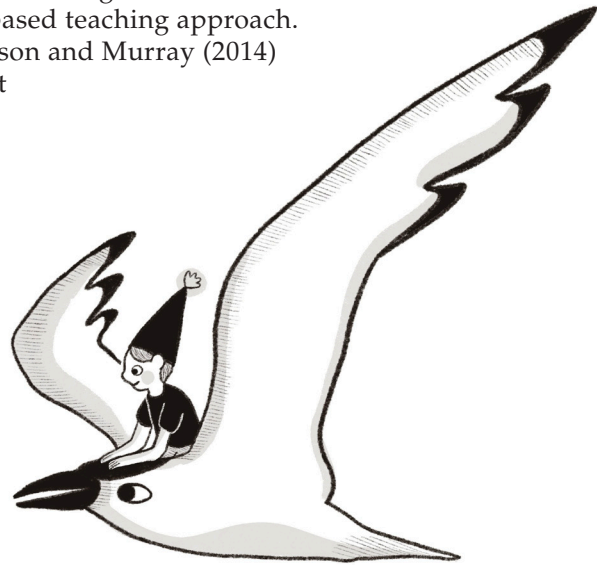
multidisciplinary. Language learning is focused on communication skills where the target language is used for a real-life purpose where students can develop their critical thinking skills (Carra-Salsberg et al., 2022, Savignon, 2008).

Knutson (2003), explores how experiential learning can positively influence two important factors in additional language acquisition: motivation and confidence. In experiential language learning, motivation is linked with the students' desire to express themselves in the target language when participating in meaningful projects. Additionally, when students are engaging in project-based learning, teachers notice "that students' ownership and control over their project can lead to a sense of empowerment and to a positive perception of themselves as successful language-learners" (Knutson, 2003, p. 60). Experiential learning in the second language classroom is not accidental; it requires careful planning and intentionality on the teacher's part to ensure that language and content outcomes are determined ahead of time (Knutson, 2003).

Outdoor Education and Additional Language Learning

Incorporating outdoor pedagogies with additional language learning in schools is a challenging task because educators face diverse additional language contexts, such as teaching a language that is not spoken by the learner, but is the dominant language of the society in which they live (Moeller & Catalano, 2015). In Alberta, the terms English as a second language (ESL), English as an additional language (EAL), and English language learners (ELL) are used to describe students who are learning English as the dominant societal language (Alberta Government, n.d.). Other language contexts include foreign language teaching, where the language that is learned in the classroom is not spoken as a dominant societal language (Moeller & Catalano, 2015). Examples of foreign language teaching in Alberta are French Immersion and the Spanish Bilingual Program (CBE, 2024).

In general, school language educators are tasked with blending content-based goals, such as science, with language goals through an additional language pedagogy termed content-based language teaching (CBLT) (Lyster, 2017). When implementing CBLT in the language classroom, Lyster (2017) recommends a "counter-balanced approach that entails a dynamic interplay between language and content" (p. 2). In this way, content and parts of language, such as skills, grammar, syntax and other linguistic characteristics, do not compete with one another, but instead complement each other. Language teaching and learning in school settings can also include a skills-based teaching approach. Christison and Murray (2014) suggest



"embedding literacy skills across the curriculum...[by] creating an integrated language curriculum that is dedicated to the acquisition of knowledge and the development of language skills—listening, speaking, reading, and writing" (p. 46). In this way, additional language skills are not treated separately, but rather as a whole.

Blending outdoor learning both as pedagogy and content for additional language learning is a relatively new area of research (Novikova et al., 2024), however studies with older students and studies from first language development have found promising insights. Myhre and Fiskum (2021) worked with Norwegian adolescents in an outdoor English as a

foreign language context in Denmark and concluded that “an outdoor setting... [supports] autonomy, and the participants can make their own choices to a greater extent, which in turn contributes to a feeling of mastery...Students experienced intrinsic motivation” (p. 213). Additionally, when considering a child’s early developmental stages, studies related to first language learning in outdoor settings indicate positive links between natural sensory experiences and children’s literacy skills growth. O’Brien and Murray (2006) observed that preschool and kindergarten children in forest schools in the UK and Wales demonstrated “development of more sophisticated uses of both written and spoken language [vocabulary and syntax]... prompted by a child’s visual and other sensory experiences” (p. 24).

Literature Review Research Design

Considering the positive links between outdoor experiences with first and additional language learning, two research questions were developed: “How can experiential outdoor learning provide context for the additional language primary classroom?” and “Which classroom strategies can enhance experiential language learning?”.

A literature review was chosen with predetermined criteria to help narrow sources to outdoor language contexts in school settings with explicit mention of classroom strategies. The inclusion criteria were: sources written in English, preschool to Grade 6 school contexts, ESL, EFL, dual immersion, bilingual, French immersion and publication dates between 2000-2024. Naturally, due to the complexity of defining outdoor education, some overlap between place-based and outdoor learning was expected. Twenty sources were identified and reflected diverse language settings from all over the world, such as Italy, Malaysia, Canada, Denmark, Colombia and the United States (US). This fact in itself demonstrates the impact that outdoor education is having in language contexts on an international level. Sources were

analyzed and key themes were coded. Similar themes were clumped together into three main categories: teaching pedagogies, classroom strategies and additional language development. Teaching pedagogies refers to educational theories used to interpret and design lessons based on curricular outcomes. Classroom strategies refers to concrete tools that can be used in the classroom, such as use of puppets, songs and nature journaling. Additional language development refers to vocabulary building and language skills, reading, writing, listening and speaking in the target language.

Research Findings

Teaching Pedagogies

The single, most mentioned pedagogy was interdisciplinary teaching with pre-planned and emergent curricular goals. For my purposes, interdisciplinary teaching is defined as blending curricula from diverse contexts, such as mathematics and the target language of instruction, in meaningful tasks through CBLT. Pre-planned curricular goals are defined as curricular outcomes that are pre-determined by the educator when designing projects and lessons. Emergent curriculum, which is an important part of Reggio Emilia educational theory (Strong-Wilson & Ellis, 2007) and outdoor education (Card & Burke, 2021), is when educators observe what students “hear, see, and think about to plan a next activity, one that will build on as well as deepen the children’s interest and investigation” (Strong-Wilson & Ellis, 2007, p. 42).

An example from the literature review that encompassed interdisciplinary, pre-planned and emergent curriculum are the documented experiences of eight and nine-year-old ESL and refugee students in a school garden in Australia in Brown et al. (2017). Students engaged in sensory experiences while learning relevant English language vocabulary associated with gardening tools, seeds, fruits and vegetables. Science, mathematics and English language arts’ curricular goals

were determined by educators and taught through weekly outdoor visits to the garden. Brown et al. (2017) supported emergent curricula by encouraging students when they independently compared and contrasted fruits and vegetables from their home countries with those grown locally in Australia. Similar interdisciplinary pedagogies were used in Larson (2016) in lessons designed for Grade 1 dual Spanish and English language learners based on Project WILD in the United States (Council for Environmental Education & Western Association of Fish and Wildlife Agencies, 2000). Larson (2016) used state English language and science curriculum standards to plan outdoor lessons to be carried out on school grounds based on observations of living beings and their habitats. Before beginning the outdoor education lessons, Larson (2016) scaffolded language learning by pre-teaching prepositions that would be required for students to express their observations outdoors in the target language. Larson (2016) also embedded emergent curricula in several instances, such as when students questioned the difference between *abejas* (bees) and *avispas* (wasps). Larson (2016) noted: “I underestimated how motivating these experiences outside would be in drawing out language. All the language planning I did in preparation for the lessons helped make them successful, but the biggest factor was having something meaningful and fascinating to talk about” (p. 60). From these examples, one can observe the endless possibilities of incorporating language and content using outdoor education pedagogy with interdisciplinary, pre-planned and emergent curricula.

Classroom Strategies

Although there were many documented classroom strategies for additional language learning outdoors, the four most prevalent strategies were: play, loose parts and realia, visuals and bringing outdoor experiences back to the indoor classroom.

The first strategy for additional language learning is the use of outdoor play. Play has

been a complex term to define throughout history as there are many forms and interpretations (Brooker et al., 2014). Stagg Peterson & Friedrich (2022) determine that “in their play, children create understandings based in the physical and social contexts of everyday life, exploring and affirming taken-for-granted relationships and roles; they try out new ways of interacting and being or take on new perspectives of familiar ways” (p. 7). In this way, when children engage in play, they are interpreting their surroundings and exploring other realities. Play was expressed in different ways in the selected sources, such as spontaneous play during nature walks (Varga, 2016), teacher-led games in the target language (Jennerjohn, 2022, Morlans, 2023), role playing (Garza et al., 2014, Reshid & Jeyaraj, 2022) and child-led nature play (Arreguin-Anderson et al., 2016, Ceccon, 2021, Kinard & Gainer, 2015, Novikova et al., 2024).

In regards to second language development, Novikova et al. (2024) found that preschool dual language learners had higher syntactic complexity, calculated as length of utterances, in the outdoor setting compared to the indoor setting. Novikova et al. (2024) suggest that:

The abundance of loose parts such as leaves, twigs, and planks reduce[d] the necessity to compete for limited space or for play materials, allowing children to concentrate on the elements of play, play roles, and use of play items and engage in conversation with their peers. (p. 148)

In Garza et al. (2014), pre-service bilingual teachers in the US participated as students in a dual language Spanish and English environmental education workshop through Project WILD. One of the key strategies for connecting content to language learning was the use of multisensory approaches involving kinesthetic and fine motor skills, such as role playing and dramatization (Garza et al., 2014). Dramatization was also found in the fictional case of studying Shakespeare outdoors (Barfod & Slattvik, 2017) and re-enacting English stories with props outdoors (Reshid & Jeyaraj, 2022).

The second strategy is the use of loose parts and realia. Loose parts are materials that are manipulable, open ended and promote creativity (Flannigan & Dietze, 2017). Loose parts can be found naturally outdoors, such as rocks, snow, pinecones and mud (Thornhill, 2017). Outdoor loose parts can also be combined with indoor loose parts, such as ropes and buckets (Thornhill, 2017). Jennerjohn (2022) found that Grade 2-5 students engaging in ESL and science lessons focused on building catapults, used human-made materials such as yarn and plastic spoons and used critical thinking to improve their catapult designs by using loose parts such as branches with holes and Y-shaped sticks. Jennerjohn (2022) noted that the loose parts allowed students to extend their creative thinking and for some, their use as natural fidget tools aided with concentration during whole group outdoor language lessons.

The use of realia was also prevalent in many sources. Realia are concrete items that promote language learning (Helman, 2020). Arreguín-Anderson et al. (2016) documented findings from an English and Spanish bilingual preschool in the US where children participated in an outdoor alphabet hunt using tools such as collection bags and magnifying glasses. Researchers reported “the use of complex and rich language in the presence of concrete objects, or referents, such as animals and plants, [which] ensures that all children, including bilingual learners can easily comprehend, or decipher otherwise abstract language” (p. 77). Additionally, teachers supported language learning through “selected sentence structures and academic words that are verbalized as children immerse themselves in nature play” (p. 78). Williams & Anderson (2015) also used realia as a classroom strategy in their work with Grade 6 English language learners in the US. Students participated in weekly 90-minute garden explorations where they used tools to dig and prepare the soil for sowing, took care of plants throughout their growth cycle and harvested fruits and vegetables. The realia that was present included gardening tools, seeds, plants and fruits

and vegetables. By engaging in outdoor lessons with all their senses, students were able to use the target language in real-life situations and to “negotiate meaning with others” (Williams & Anderson, 2015, p. 36). To document their learning throughout the investigations, students used photography, sketching and other visual means to record their experiences.



The third strategy for additional language learning outdoors is the use of child, teacher and child-teacher co-created visuals. Children can represent their learning and experiences visually through dioramas, visual journaling, sculpting with clay, map-making and creating posters. Escamilla et al. (2020) explored the importance of child-created visuals with preschool dual language learners of English and Spanish through sketching and sculpting encounters with turtles. English and Spanish language nouns such as *reptile* (reptile), adjectives such as *bonita* (pretty) and verbs such as *dibujar* (to draw) were blended through content-based approaches. In their research, Escamilla et al. (2020) state that “the use of visuals...to represent scientific observation [outdoors] and learning is a critical option for emergent bilingual children, who are learning to speak about and understand science concepts in two languages” (p. 169). The importance of child-created visuals as referents is also supported by Reggio Emilia founder Malaguzzi in Edwards et al. (2012), where he states that graphic representation allows children to communicate their understandings and in doing so, must select their ideas, use symbols and choose what

to represent graphically so that their ideas come across to the viewer. Children can then use their visuals as referents when speaking in the target language.

Although not as commonly mentioned in the identified sources, teacher-created visuals also support additional language learning. As stated by Crandall (2012), “the use of demonstrations, visuals, charts, graphic organizers and outlines, breaking down [linguistic and content] information into smaller chunks, pre-teaching vocabulary, and establishing back-ground information” (p. 152). The use of visuals was present in Morlans (2023) with Grade 3 students in Catalonia who engaged in outdoor EFL lessons on water. EFL curricular goals were focused on vocabulary building, such as snow, water, ice, swim, drink, wash, solid, liquid and gas. Morlans (2023) created flashcards of new vocabulary that were used outdoors by children to support language learning activities such as labeling states of matter during the water cycle, playing charades, creating a water filter and engaging in a scavenger hunt. Morlans (2023) observed quantitatively and qualitatively that students had lowered foreign language anxiety (FLA) and higher foreign language enjoyment (FLE) when learning English outdoors as compared to indoors. Additionally, both students and teachers reported a more relaxed environment outdoors with opportunities for play and movement using the target language.

Child and teacher co-created visuals were explored in various sources such as Varga (2016), where the teacher/researcher participated in daily nature walks with her Grade 1 and 2 French Immersion class. After their walks, the teacher and students co-wrote a morning message in French based on their observations and students added illustrations. These morning messages and illustrations were posted in the classroom and used as visuals throughout the year. New French words were added to the Word Wall as needed to describe their experiences, such as high frequency words and adjectives to express

sensory experiences outdoors. The morning messages were collected and used through daily activities, such as paired reading and whole-class reading. Although there were additional factors, such as guided reading and one on one parent/teacher support through the year, Varga (2016) states that compared to previous years, her students “are excited to see the connection between the sounds that we learn each week especially when they find those sounds in other texts. They are also interested in the words, sentences and information that we’ve been writing in our [morning] messages about our outdoor activities.” (p. 164).

The fourth strategy, as noted by many researchers (Arreguin-Anderson & Esquierdo, 2011, Tangen & Fielding-Barnsley, 2007, Varga, 2016) was bringing outdoor experiences back to the indoor classroom. Collecting natural realia and talking about outdoor experiences in other contexts supported connections between various disciplines. For example, Westervelt (2007) mentions encouraging ELL students to use their senses when observing outdoor plants and later, bringing their knowledge back to the classroom to create collage posters that incorporate writing about their observations/experiences. Arreguin-Anderson & Esquierdo (2011) mentions bringing leaves collected by children indoors for further explorations, while in Stewart (2006), ELL students use photography to document their observations in their school garden, which they later use in the classroom to create a photo journal to be used as a visual when speaking in English. Reggio Emilia teaching approaches support bringing the outdoors inside using technology, like cameras and webcams, to document student observations and to project outdoor environments indoors (Reggio Children, 2019). Outdoor loose parts can be brought indoors to investigate with magnifying glasses and microscopes and represented through different art mediums. (Reggio Children, 2019).

Additional Language Development

The final findings pertain to the development of the target additional language through vocabulary building and language skills: reading, writing, listening and speaking. The majority of sources identified target language vocabulary building in authentic settings as a key benefit of outdoor learning. For example, Stewart (2012) explored building basic interpersonal communication skills (BICS) or social, everyday language, and cognitive academic language proficiency (CALP) (Cummins, 2013), or academic specific language, through garden experiences for kindergarten through Grade 2 students. Oral language skills (listening and speaking) were the most mentioned additional language skill in the sources, such as Tangen & Fielding-Barnsley (2007) where ESL and refugee students felt motivated and with a sense of purpose when expressing their garden experiences in English. Writing was addressed through nature journaling, charts, note taking, summarizing and poetry writing as was the case in Salazar Jaramillo & Espejo Malagón (2019). Reading was the least mentioned skill and appeared in some sources such as Williams & Anderson (2015) where ELL students researched their chosen “Harvest of the Month” (p. 36) fruit or vegetable from their school garden when adding information to their poster.

Discussion

Returning to content-based additional language instruction according to Lyster (2017), it is important to recall the balanced approach between content and linguistic components of language learning. According to the literature review, outdoor education can provide opportunities for rich interdisciplinary and content-based learning in diverse language contexts, which refers to the experiential component as expressed by Lyster (2007). Outdoor environments provided inspiration for relevant vocabulary building and opportunities to develop listening, speaking, reading and writing skills in the target language. Linguistic components, such as grammar, vocabulary

and syntax of the target language were also addressed in some of the sources.

Although at least one language skill was mentioned in every source, rarely were connections between skills discussed. Varga (2016) stated an important observation in her work with Grade 1 and 2 French Immersion students:

The development of oral language skills and the use of French for speaking and listening was an important consideration during this research as all four language skills of reading, writing, speaking and listening support and help the development of each other in the second language classroom. (p. 84)

As previously mentioned, a skills-based approach to additional language teaching connects language skills to one another within a meaningful context. But how does an educator achieve that in an outdoor setting?

The How: Connecting All Language Skills Through the Neurolinguistic Approach

The Neurolinguistic Approach to additional language teaching (NLA) can aid in planning outdoor education and additional language lessons that are both experiential and linguistically sound. NLA is gaining precedence in Canada as an additional language pedagogy focused on the neurological, linguistic and literacy development of language learners within meaningful contexts. Germain (2018), one of the founders of NLA, states that when integrating language skills through the literacy loop “it is possible to have learners use and reuse, in similar contexts, the various language structures that they have just used, thereby creating patterns or ‘pathways’ in their brains” which leads to internalizing language structures to implicit knowledge” (p. 23). Through the literacy loop, students engage in repeating new vocabulary and structures by means of listening, speaking, reading and writing, with the focus always beginning with oral language (Germain, 2018).

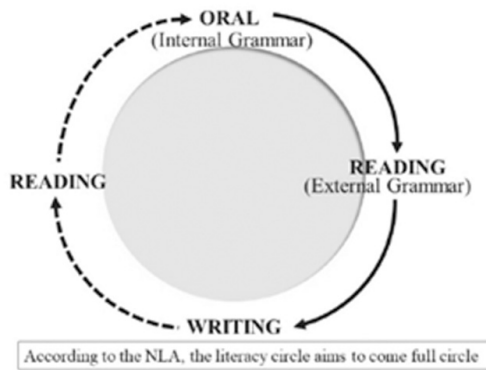


Figure 1: NLA Literacy Loop (Germain, 2018, p. 20)

There have been a couple studies related to the use of NLA in the German Bilingual Program in Calgary, Alberta (Dressler & Mueller, 2022 and Dressler & Mueller, 2020), however connecting NLA with outdoor education practices is an unexplored area of study. In using the NLA approach with outdoor learning, students could build oral capacity by talking about their observations and experiences outdoors in structured conversations (question and answer stems) in the target language. This linguistic knowledge is scaffolded and built upon as students engage through the literacy loop, by exploring reading materials, such as child and teacher co-written morning messages, with similar content and linguistic characteristics, later writing about their outdoor experiences, sharing their writing with their peers through reading and finally, returning to the oral component. In this way, language structures, vocabulary and grammar are repeated through all language skills and can become implicit knowledge through a relevant and experiential context, the natural environment. Language skills are not treated as separate from one another, but instead are developed together to support one another.

Conclusion

Offering students opportunities to learn an additional language in authentic, outdoor settings promotes holistic language learning. Spending time in nature supports creativity, lowered anxiety, increased enjoyment and

mental and physical benefits. Through careful planning with content-based and skills-based approaches, language educators can design meaningful lessons based on school curricula that leave space for emergent student interests. Classroom strategies, such as use of play, realia and loose parts, child, teacher and child-teacher visuals, as well as bringing outdoor experiences back to the indoor classroom, support experiential language learning. Promoting vocabulary building through hands-on activities provides meaning to language learning with concrete realia and experiences. As research continues in the field of outdoor education and language learning, perhaps connecting outdoor learning through the literacy loop of the neurolinguistic approach may support a balance between content and language that educators strive for. As I continue to explore how to encourage my students to connect with a new language, I return to the value of experience and the importance of joy as expressed in the vignette. The joy in my students' eyes and smiles as we learn and connect with a new language in the most authentic setting of all, nature. *Niente senza gioia* (nothing without joy) (Malaguzzi in Edwards et al., 2012).

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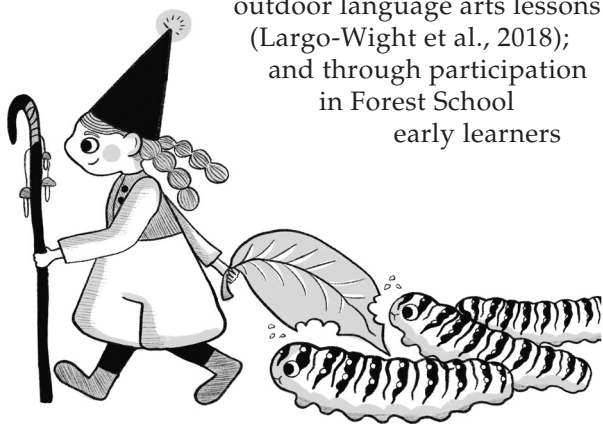
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Building Knowledge for Reading Comprehension in Forest School: Teaching Science Is Teaching Reading

By Denise Heppner and Tirzah Reilkoff

It was October when we began our research and the leaves had begun to fall in Forest School. Red, orange, and gold intermingled with the green of pine needles and fading grass. The kindergarten/Grade 1 students had begun to wear their mittens and hats as the temperatures began to drop. Additional clothing layers did not deter these students and their teacher from exploring their outdoor classroom. “Forest School”, a treed area behind the school, is a daily adventure for this class where students explore their natural and social worlds. Although often given a learning target (e.g., find something “big” and something “tiny”), the students are encouraged to spontaneously engage in inquiry and investigations about their environment and world.

As teachers, we knew Forest School was a magical place where students’ curiosity led the way to deeper learning. We wanted to explore what we were seeing and submitted/received a research grant from the McDowell Foundation (2022) allowing us to engage in action research to investigate emergent literacy within this outdoor educational context. Research shows that children are healthier, happier and more attentive when outdoors (Louv, 2005). Studies related specifically to literacy reveal that kindergarten students are consistently more on-task during outdoor language arts lessons (Largo-Wight et al., 2018); and through participation in Forest School early learners



demonstrated greater gains in reading and writing abilities than their matched peers in traditional indoor classrooms (McCree et al., 2018). The outdoor context provides many opportunities for early literacy development. Rich, reciprocal dialogue occurs in the storied environment of the outdoor classroom as the teacher and students explore the world together: “Each phenomenon presents the opportunity to use language as a tool for observation and inquiry. What do you notice? What do you think is happening here? How can we find out more?” (Wright, 2016, para. 4). As students seek language that reflects their experiences, new vocabulary is introduced contextually (Peterson, 2016).

Many think that teaching reading primarily focuses on developing proficient decoding skills. However, decades of research into the science of reading reveals that language comprehension abilities are also essential for reading, and both must be strong to achieve reading comprehension. Foundational to understanding early reading development is Gough and Tunmer’s (1986) Simple View of Reading and Scarborough’s (2001) reading rope, which illustrate the many skills that are woven together in competent reading. Gough and Tunmer’s (1986) Simple View of Reading formula demonstrates that reading has two basic components:

Decoding (D) x Language Comprehension (LC) = Reading Comprehension (RC)

Scarborough’s (2001) work expands on each of these components with Language Comprehension including: background knowledge, vocabulary, language structure, verbal reasoning, and literacy knowledge. Through our exploration of emergent literacy within Forest School, we found that each of Scarborough’s (2001) component skills contributing to the

strands within Language Comprehension were nurtured in student-centred ways. For the purpose of this brief article, we highlight our discoveries regarding the strand “background knowledge” (e.g., facts, concepts, etc.) as it pertains to the development of reading.

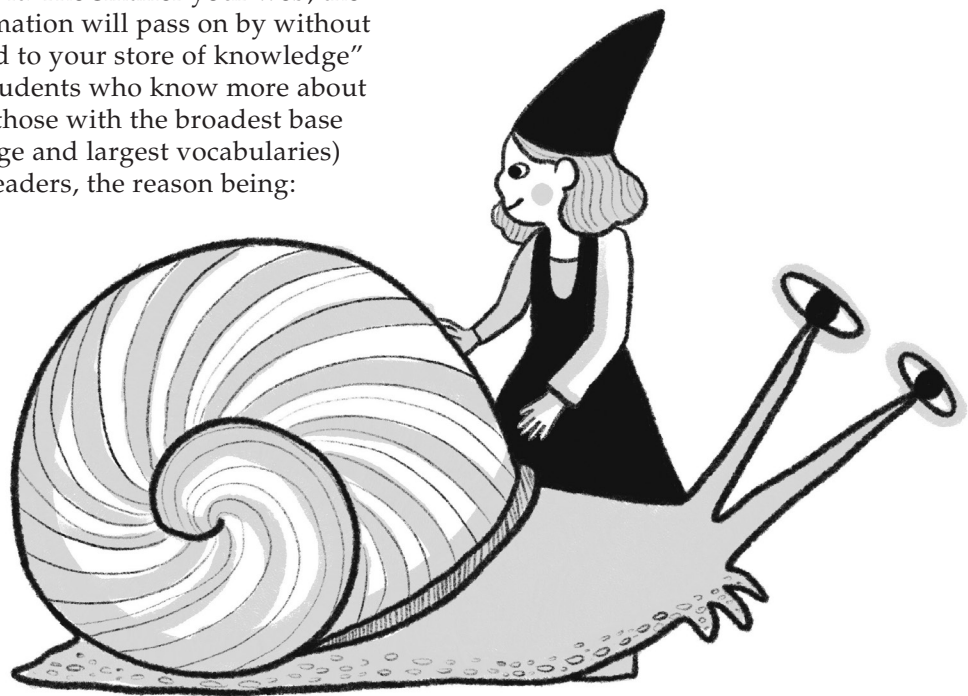
Knowledge Is Power

“For reading comprehension, knowledge is power” (Redford, 2020, p. 52). Cognitive scientist Daniel Willington (2009) argues that we need more than vocabulary to read with understanding, we need knowledge of the world. With strong decoding skills students can decode almost any text, however they may not be able to make meaning from it. Expert readers draw from their background knowledge to use context clues to figure out new vocabulary, anticipate where texts may be going, and ask reflective questions (Goodwin, 2020).

Like a snowball effect, knowledge builds on knowledge. An advocacy group comprised of scholars and teachers, Knowledge Matters Campaign (2024a), illustrates that students’ core knowledge is like a sticky web: “The bigger your web, the more stuff will stick to it. The smaller your web, the more information will pass on by without being added to your store of knowledge” (para. 5). Students who know more about the world (those with the broadest base of knowledge and largest vocabularies) are better readers, the reason being:

“both broad general knowledge and topic-specific knowledge are necessary to extract meaning from language” (Knowledge Matters Campaign, 2024b, p. 8). With K-3 teachers reporting spending only 19 minutes a day teaching science and 16 minutes a day on social studies (Knowledge Matters Campaign, 2024b), students are at a knowledge deficit, which ultimately impacts their reading abilities.

Addressing the thorny question of what, among the proliferation of available information, core knowledge we should teach, the Core Knowledge Foundation (2024) provides a list of content and skill guidelines from kindergarten through eighth grade. In science, students are introduced to topics in life science and physical science in kindergarten and then revisit many of the topics in greater depth in later grades; “topics include living things and their environments, the human body, cycles in nature, ecology, geology, meteorology, magnetism, simple machines, light and optics, sound, matter, electricity, and concepts in chemistry and physics” (Core Knowledge Foundation, 2024, Science, para. 1).



As we examined our data from Forest School we discovered that, following our students' lead, we had addressed many science topics recommended by the Core Knowledge Foundation (2013; 2024). For example, in addition to many discussions about weather, plants and animals (finding tracks and scat being a favorite evidence find!) the class explored seasons, the human body, and taking care of the earth. The following are excerpts from Forest School.

Seasons

Teacher (speaking to students just outside the designated entrance to Forest School): "Look at these colors! What happens in autumn to the leaves?"

Student: "They faaall. It's like a carpet!"

Teacher: "Yes, they all fall! But there are certain trees that don't lose their leaves. Cedars, pine trees, and spruce trees keep their needles. So, they get to stay nice and green. But most of the trees that we have here are starting to lose their leaves. And all those leaves faaaaall to the ground and they make a carpet of color for us to walk on" (Field Notes, October 20, 2021).

The Human Body

Teacher (after discussing the five senses while everyone is sitting in a snowbank): "So, while you are sitting here, I want you to breathe in through your nose and see what you smell."

Student: "Snow."

Teacher: "You smell snow, that's interesting! What does snow smell like?"

Student: "It smells like water."

Teacher: "Hmm it smells like water. It kind of doesn't have a smell but when you breathe in [everyone inhales slowly], it feels cold in your nose. Feel that again [everyone inhales deeply]. Now breathe out [everyone exhales]. It feels warm. So, when we breathe in [inhales] you can feel the cool air. Now breathe out [exhales]. Your body warmed up your air and you are breathing it out warm" (Field Notes, December 14, 2021).

Taking Care of the Earth

Teacher (sitting in a circle after calling a meeting to address killing games and sticks being used as guns): "So, what other kind of game can you play where you can run around with sticks but you're not killing?"

Student: "Hunting?"

Teacher: "Yes, we could play hunting games...when we go hunting we are only shooting animals, and we're only shooting animals for one purpose and that is so we have food. We are not killing people [some of the students begin to hit their sticks on the ground within the circle] ...I actually like what I'm seeing you guys are doing with sticks! You guys are playing a drum! If everybody got a stick, and we played the drum that's like the heartbeat of Mother Earth. And that is showing respect to her. Shooting one another, killing each other, it's not showing respect to Mother Earth. I'm going to find a stick too because I would like to join you because this is making my heart happy to join with Mother Earth [all begin to tap rhythmically]. Boys and girls, this is the heartbeat of Mother Earth...If you put your hand on your heart, your heart makes that same sound when it goes 'thump', 'thump', 'thump', 'thump'. And we are showing honor to ourselves and our ancestors and to our friends that are in the circle when we are playing the drum together" (Field Notes, October 20, 2021).

Teaching Science Is Teaching Reading

Teaching science is teaching reading. Through facilitating the use of scientific inquiry in Forest School, our students are developing the broad base of background knowledge that is essential for effective reading comprehension. As the weather grows colder and the layers of clothing increase, so do the students' layers of knowledge, both protecting and enabling our students to move competently and joyfully in their respective environments.

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Sympathetic and Parasympathetic Responses in Outdoor Learning: Why It's Important to Alternate Challenge and Nature so as to Reflect and Connect

By Simon Priest

What Is Happening in the Body?

Outdoor learning experiences are often a blend of exposure to challenges and immersion within nature. During adventurous outdoor learning, challenge exposures usually come in three forms: [1] enduring difficult exercise or extreme hardships leading to physical fitness, [2] taking personal perceived risks leading to healthy self-image or emotions, and [3] resolving group conflicts during problem solving situations leading to better pro-social skills. During environmental outdoor learning, nature immersions usually take three forms: [1] restoring and rejuvenating one's self leading to greatly improved mental wellness, [2] developing connection for resources leading to pro-environmental behaviours or ecological action, and [3] understanding personal roles in community, society and the planet leading to spirituality. In summary, these six dimensions of wellness (physical, self-image, prosocial, mental, ecological, and spiritual) coalesce to create beneficial ecohealth (Charron 2012; Parkes, 2011; Ritchie et al., 2022).

The human reaction to fear of a challenge is either to "fight" during conflict with peers or to take "flight" away from dangerous risks or difficult hardships. Challenge triggers a sympathetic response in people. The sympathetic response is for emergencies and readies humans for action. It raises heart rate, cardiac contraction force, and blood pressure. It dilates the eye's pupils, bronchioles within the lungs, and blood vessels in muscles. It restricts blood flow to the digestive system, slows peristalsis (ingested nutrient movement) through the gut, and shrinks urine production and output (Biaggioni et al., 2023).

Human reaction to nature is both to "reflect" on recent experiences and to "connect" with the beauty and awe, peace

and tranquility, or intricacy and complexity of the local environment. Nature kindles a parasympathetic response in people. The parasympathetic response is for taking it easy and helps people to calm down. It lowers heart rate, cardiac contraction force, and blood pressure. It constricts the eye's pupils, bronchioles within the lungs, and blood vessels in muscles. It accentuates blood flow to the digestive system, accelerates peristalsis, and boosts urine production (Biaggioni et al., 2023). These key processes are diagrammed in Figure 1.

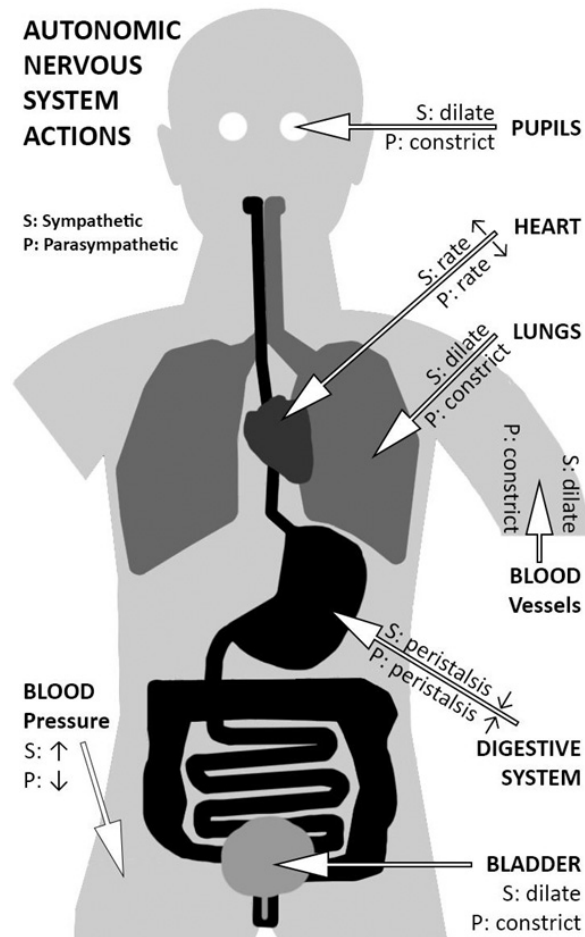


Figure 1: Autonomous Nervous System Actions

Sympathetic innervations in response to outdoor adventure challenges are known to increase the levels of several hormones related to stress: adrenaline/epinephrine, noradrenaline/norepinephrine, and cortisol released from the adrenal glands. These are the body chemicals that prepare people to “fight or flight.” So measuring these gives researchers an understanding of how stressed participants are during challenges (Bunting et al., 2000). Parasympathetic activations are a result of mindful nature immersions and are known to increase heart rate variability (HRV) and several HRV-related indicators such as computed frequency power and variance coefficients. A variable heart rate changes in response to environmental conditions, so measuring this gives researchers an understanding of how relaxed participants are when in nature (Brown et al., 2013). Everything for these two activations is controlled by the brain.

What Is Occurring in the Brain?

Anatomically, the human nervous system is composed of the brain (100 billion neurons or nerve cells), spinal cord (100 million neurons), and nerves (7 trillion neurons). The central nervous system (mostly the brain) generates electrical impulses and transmits these via the nerves of the peripheral nervous system (mostly spinal cord and nerves). Impulse transmission is achieved by the rapid passage of varied molecules (glutamate, dopamine, serotonin, acetylcholine, etc.) between the neuron gaps or synapses.

Nerves in the peripheral system are divided into three subsystems: the somatic, autonomic, and enteric. The somatic subsystem voluntarily controls human movement through consciously stimulating skeletal muscle contraction. The enteric subsystem governs automatic digestion by unconsciously stimulating smooth muscle contraction to move food through the alimentary canal by peristalsis (Paxinos & Mai, 2012). The somatic and enteric subsystems are not so important in this article, but to ignore either at the outset would be horribly remiss.

The more important autonomic subsystem influences internal organs and glands through relatively unconscious nerve impulses and thus regulates body function through hormones or other methods. This is the subsystem that controls: heart rate, blood pressure, respiration rate, pupil size, sexual arousal, urination, and parts of digestion (Paxinos & Mai, 2012). These functions are moderated by opposing sympathetic and parasympathetic responses. One response increases a body function, while the other decreases it. The brain is the boss of the autonomic nervous subsystem and decides how to respond to each short term and long term situation the body finds itself in.

One interpretation (MacLean, 1990) suggests that the human brain has evolved through three layers, each enveloping the prior: reptilian (sensing), paleomammalian (feeling), and neomammalian (thinking). This has taken place according to evolution: from reptiles and amphibians via mammals to humans. A cut-away diagram of this arrangement and some key structures is shown in Figure 2.

The reptilian complex (instinctual or sensing brain) is the inner layer connected to the spinal cord. Within this layer, the brainstem regulates breathing, digestion, reflexes, blood pressures, bladder, and bowels. The cerebellum coordinates balance, voluntary movements, and posture. The basal ganglia code procedural memory, habitual behaviours and conditional learning. Collectively, these inhibit certain behaviours and routinely maintain life through automated respiration and heartbeat.

The (old) paleomammalian complex (emotional or feeling brain) is the middle layer wrapped around the reptilian inner. Within this layer, the amygdala processes emotions and manages responses to fear and pleasure. The hippocampus consolidates memories and places emotions in context of time and place, so these can be understood by other parts of the brain. The thalamus manages sensory input among

body parts. The hypothalamus regulates the autonomic nervous system. Collectively known as the limbic system, these structures moderate and mediate the sympathetic and parasympathetic responses.

The neomammalian complex (rational or thinking brain) is on the outside, wrapped around the other two. Within this layer, the prefrontal cortex (PFC), which is the main lobe behind the forehead, manages memory and higher cognitive functions, such as decision making, problem solving, and sound judgment. The medial prefrontal

cortex (mPFC), above the eyes, processes fear responses, regulates emotions and impulse control, codes emotional and cognitive input to store memories of feelings and thoughts. Collectively called the neocortex, these areas manage most of the conscious thoughts associated with language, perception, interpretation, creativity, analysis and emotional regulation (Woolsey et al., 2017).

Thinking is only a quarter of the brain's workload and learning takes place in all three layers. Aside from the intelligence

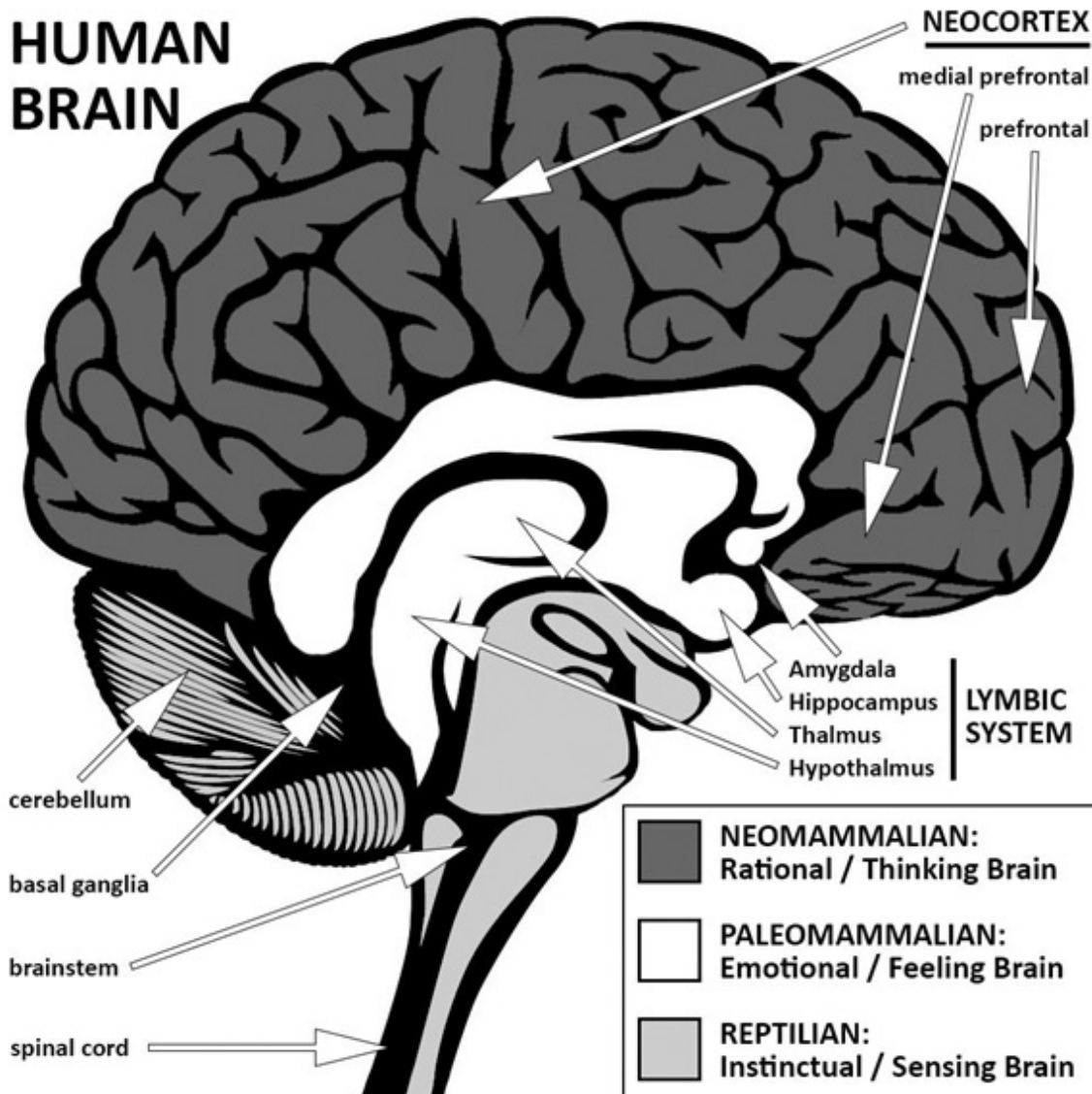


Figure 2: The Human Brain

and conceptual learning taking place in the outside neocortex or neomammalian brain, reflexive and habitual learning is processed in the inner reptilian brain, with physical or psychomotor task learning found in the hippocampus of the middle paleomammalian brain (Curlik & Shors, 2012).

The brain is a flexible organ that changes throughout the course of one's life. These changes, created by growing new brain tissue (neurogenesis) or rewiring neural pathways (neuroplasticity), are how humans learn and change. For example, the prefrontal cortex is not fully developed until the age of about 25 years and is the first part of the brain to show degeneration in normally aging seniors. Since this area of the brain houses higher order cognition like managing memory, planning or organizing, "distinguishing between conflicting thoughts, ... determining extremes, anticipating consequences, ignoring distractions, [and] predicting outcomes" (Priest & Gass, 2018, p. 344), it is the center of decision making, problem solving, and sound judgment for participants being transformed through outdoor learning.

What Are Participants Doing?

Participants in outdoor learning experiences are constantly perceiving and interpreting the information they obtain from novel situations they find themselves placed in, both adventurous and environmental. For this they use the rational or thinking part of their brains (neomammalian or neocortex). How they react to this unfamiliarity is determined by the hypothalamus in the emotional or feeling parts of the brain (paleomammalian or limbic). Their reactions result in outcomes of success, failure, or ambivalence.

Whatever results and how they reflect on those outcomes determines how their brains will transform and gain neuroresilience, and thus how they will achieve personal changes in their feeling, thinking, behaving, or resisting (Allan et al., 2012). Multisensory input is extremely valuable for thinking,

since many senses inputting information to the brain is synergistic compared with only one sense as a source of input (Werner & Noppeney, 2010). During reflection, their brains attempt to derive meaning from this sensory information and metaphorically apply that meaning to their daily lives (Priest & Gass, 2018).

In adventures, the situations participants are placed in are challenging, such as overcoming long journey hardships, resolving conflicts that arise during group problem solving exercises, and surmounting risks created from apparent dangers (great heights, unknown darkness, slippery snow, or rough deep water). In response to these authentic adventures, they may experience fear and/or distress coupled with dissonance. Dissonance involves holding two opposing thoughts in the mind at the same time: both ideas cannot be simultaneously true (Festinger, 1957). A classic example of dissonance is the common expression heard from many participants as they temporarily freeze: "I am very safe and I'm gonna die!"

Their brains are confused and afraid, so respond with sympathetic activation. Each brain sends electrical impulses along specialized nerve pathways via a cascade of dedicated neurotransmission chemicals: acetylcholine and noradrenaline/norepinephrine. This ensures that impulses travel at lightning speeds to various target tissues. At one important target tissue, the adrenal glands (located atop both kidneys), a powerful cocktail of hormones (adrenaline/epinephrine, noradrenaline/norepinephrine, cortisol, etc.) is simultaneously pumped directly into the bloodstream and in less than a second these energetic motivators are distributed throughout the body by the circulatory system. Each part of the body responds differently, but in concert with one another, to this wave of hormones (Biaggioni et al., 2023).

Readying for a fight or flight, lung airways open up to bring more oxygen into the body. Heart rate and blood pressure rise

and thus increase the circulation of oxygen throughout the body, but especially to the heart and brain, which are working hard. Blood vessels dilate, sending more blood to the skin (feeling warmer, maybe with some sweating or goose bumps) and to the muscles (feeling stronger) in preparation for action. Pupils widen to allow more light into eyes, thus momentarily improving vision.

At the same time, other systems (temporarily unneeded for fight or flight) begin to slow. Motility in the intestines decreases and salivation shuts down, but movement of food in the esophagus is accelerated, just in case a person was eating at this inopportune moment. Kidneys get less blood (reducing their filtration output), the bladder expands (to store rather than release urine), and reproductive urges are inhibited. All of these rapid changes occur in less time than it takes to read these four paragraphs.

On the other hand, for environmental outdoor learning, participants are typically placed into natural settings with artistic expression or scientific investigation of ecosystems, immersion within nature's recuperative properties, and deep mindful examination of our place in the world and environment. In response to these opportunities, they may experience serenity, peace, tranquility, and even additional dissonance, especially when they compare time in nature with their daily routine. A common remark for people who don't usually spend much time in nature is: "I am a depressed and anxious person, BUT in nature I'm different!" Perhaps their outdoor learning and change will be to seek out nature more often.

Calmed and not afraid, their brains respond with electrical impulses. These are not in a rush and travel primarily down branches of the vagus nerve (longest in the nervous system running from neck to colon and communicating between many body organs and the brain). One common neurotransmitter (acetylcholine) facilitates sending an electrical impulse to various body organs. An important exception is that parasympathetic stimulation is not linked

to the adrenal glands, so no stress hormones secrete.

Readying for "love and lunch" or "feed and breed," the vagus nerve reverses previous activation of the lungs and heart, returning heart rate, respiration, and blood pressure to near normal. Blood vessels constrict, sending less blood to the skin and to the muscles. Pupils narrow and allow less light into the eyes. Interestingly, the vagus nerve's interaction with the innate pacemaker of the heart causes heart rate to vary with the pace of respiration (faster during inspiration and slower during expiration), thus making HRV and its derivatives extremely accurate methods of measuring parasympathetic activity.

At the same time, other systems, no longer slowed, begin to speed up. Motility in the intestines increases and salivation ramps up. Kidneys get more blood (raising their filtration output), the bladder contracts (to release rather than store urine), and reproductive urges are enabled (Biaggioni et al., 2023). All of these leisurely modifications take more time to fully complete than it takes to read this article.

Upon completion of a challenge or nature experience, outdoor learning participants pause to reflect on what they learned and are now willing to change about their feelings, thoughts, and behaviours. This reflection normally follows as soon as reasonable after the experience and, if possible, is not postponed until later that day or the next. Reflection can be achieved through group debriefing discussion, solo contemplation, and a sequential combination of the latter followed by the former. The parasympathetic response is engaged during reflection and is particularly potent in nature (Gladwell et al., 2012).

What Should Practitioners Be Doing?

Since participants are constantly perceiving and interpreting situational information in outdoor learning, they can sometimes choose not to be afraid (drastically lessening

the sympathetic response) or may be unable to uninhibitedly immerse in nature (thereby preventing a parasympathetic response). Outdoor learning practitioners can execute a number of best practices to aid participants in their experiences.

For those participants who are not afraid, rather than modifying the challenge in order to frighten them, practitioners might want to consider helping participants to: celebrate their already existing mastery of the situation, investigate the strategies and tactics in use to manage fears, and examine the dominant internal or external locus of control in their actions. For participants who are unable to immerse, rather than putting undue pressure on them, practitioners might want to consider: allowing more time (takes longer for parasympathetic responses to kick in), suggesting mindful meditative exercises to help with submersion, and probing their current emotional states. Here are some additional recommendations.

First, practitioners in outdoor learning will purposefully seek out situations with high perceived risks in order to encourage a sympathetic response from participants. Obviously, the real dangers should be avoided or managed at acceptable and recoverable levels to ensure the “safety” of participants, who have a right to experience the above without getting hurt. Practitioners do not manufacture hardships, conflicts or risks, and do not force or coerce participants to engage. Instead, practitioners select adventure experiences, activities, and exercises, where these opportunities will arise as expected. Similarly, they must warrant that learning consequences will come from nature and not practitioners.

Second, when dissonance presents in the outdoors, practitioners should make themselves available to the participants for conversations that clarifies safety and encourages attempts to resolve dissonance by moving forward with the challenge activity or immersion in nature. This can be accomplished by altering their perceptions of past performances, adjusting their interpretations of future outcomes, convincing

them to change their attributions of success or failure, and helping them discover how best to treat one another, openly discuss feelings, correctly perceive competence, and choose motivations (Mouse, 2023).

Third, when dissonance doesn't occur for participants, don't be too concerned. Outdoor learning programs are robust enough to present several dissonance opportunities and non-dissonance benefits from challenges and nature will still be accrued by participants. Simply continue as planned.

Fourth, during times of sympathetic innervations, participants will run the gamut of emotions from excited to angered to afraid. Practitioners should be prepared for any emotional response from participants to adventurous challenges. Being prepared also requires being emotionally vulnerable and genuinely exhibiting complete emotional counseling from practitioners to participants (Sharpe, 2017).

Fifth, during times of parasympathetic innervations, participants will span a range of needs from silence to solitude to reaffirmation without disturbance. Practitioners should be prepared to address these needs by providing quiet, peaceful, serene, calm, tranquil, and uninterrupted time in nature. Pro-environmental behaviour is shaped positively by harmonious passions (a sense of control and self-identity: “I am an outdoorsy person”) and negatively by obsessive passions (a lack of control and self-identity) with emotional motivation through close affiliation with nature (Junot et al., 2017). Therefore, practitioners ought to downplay compulsions and enable participants to be in control while feeling connected to nature. This suggests avoiding any challenges or sympathetic innervations in reflection.

This will not be a perfect back and forth. For example, inclement weather during environmental learning will add stress to the supposedly relaxing situation. Practitioners will want to make sure that participants are well protected from the hot/cold, wet/dry, or doldrum/windy extremes. Similarly, nature's awe and beauty in the midst of

challenges can relax participants, when they might benefit more from being tense or on edge. Practitioners can avoid conducting adventures in pristine locations, when any setting would suffice. Not only does this protect the outdoors, but doing so can also be good pedagogy.

When participants' parasympathetic responses activate in nature, they may need to urinate, defecate, eat or drink, especially after sympathetic excitation in an adventure. Practitioners should understand that this may be an overwhelming urge and provide space and time for participants to take a bio-break. Unfortunately, in a few cases, a strong parasympathetic response can follow a strong sympathetic one, common in times of extreme emotional distress, and this overcompensation can cause a brief loss of control for bladder or bowels. Be ready to assist participants with any discomfort or embarrassment and subtly limit food and liquid intake before any emotional or nervous system crashes are anticipated.

Sixth, in times of reflection, practitioners will want to guide participants through a series of provocative questions to enhance thinking. This can begin as solo contemplation, move through small group (dyad or triad) exchange of thoughts, and into large group dialogue that reinforces or contradicts thinking. Even for indoor adventure, participants should be encouraged to go outside into nature for reflection.

Seventh, practitioners are strongly encouraged to alternate between challenges and nature approaches. Doing so gives each activation response the chance to recover and not suffer the repercussions of over use. Furthermore, this provides the added opportunity for participants to reflect on challenges and connect with nature. For additional details on this article's premise, please read the argument below.

The Argument

Integrating the adventurous and environmental branches of outdoor learning has long been promoted (Priest, 1986).

Practitioners have been encouraged to conduct pond studies from tandem canoes and to examine life on a cliff face with human impact while rock climbing. The ability to integrate both branches means that the ecosystemic (within nature) and ekistic (human nature reciprocity) relationships of environmental outdoor learning can be combined with the interpersonal (among people) and intrapersonal (within self) relationships of adventure, leading to the possibility of a fifth relationship: spirituality (Priest, & Gass, 2018). This argument for integration is purely pedagogical.

The physiological argument is three fold. First, too much of one branch, adventurous or environmental, can over-tax the autonomic nervous system by burning out either the sympathetic or parasympathetic activation system. These systems need time to recover. Constant stimulation of the sympathetic response in people under ongoing stress (soldiers, first responders, professional drivers, executives, aging citizens, and the obese) shows increased incidence of migraines (Peroutka, 2004), circulation problems (Leenen, 1999), and cardiovascular damage (Seals & Dinunno, 2004). Less obvious are the concerns for chronic stimulation of the parasympathetic response in people who are too often relaxed, perhaps due to prolonged meditative states with shallow breathing and greatly reduced heart rates, who may suffer under-oxygenation of the heart, brain, and other tissues, without noticing subsequent damages until much later in life (Aebi et al., 2019; Sao & Chauhan, 2008; Shraga, 2020).

Second, by alternating adventurous and environmental as part of the same outdoor learning program, practitioners can ensure that participants get the opportunity to reflect on their challenges, while immersed in nature. Reflection should begin with solo contemplation, move to group discussion and be aided by questioning techniques and a number of facilitation procedures (Priest et al., 2022).

Third, and similarly, time relaxing in a natural setting and then becoming active in that same setting can cement participants'

spiritual link with nature as place and as experience (Gooley, 2018). Outdoor learning seems prone to an “either/or” approach and what is needed is an “and/both” approach. Instead of seeing nature as a place to relax or an event to be experienced, participants in outdoor learning should understand that something more is possible when both are considered concurrently. By merging place-based learning with experiential learning, participants can develop affinity for the land and a kinship with travelling through the landscape. Instead of seeing it as a resource or amusement park, they can view nature as essential for the sustained continuance of life on the planet. Rather than observing humans as apart from nature, they can believe humans are a part of nature. Again time spent developing these spiritual relationships requires time in nature (to become mindful, comfortable or self-sufficient) with a rich flooding of the senses that stimulate the limbic system (Franco et al., 2017).

However, practitioners should avoid exerting too much control over the participants’ experiences. Long, lacklustre periods will be tedious for them. Rapid-fire switching through brief samples of challenge and nature immersion will create angst. Well considered and alternating opportunities, with time to enjoy the sympathetic response and deeply submerge in the parasympathetic response through mindfulness, will hold attention and generate meaningful learning in the brain. “Interspersing organised chunks of learning with interruptions for explanation, or quiet time [for reflection], allows new material to be absorbed as new brain cells are created and neural pathways strengthened” (Allan et al., 2012, p. 7).

Properly facilitated outdoor therapy programs alternate adventurous challenges with reflection and connection in nature (Hart, 2016). Under the supervision of a licensed therapist, graduate-degreed psychologist or health care professional, these present a good model for outdoor recreation, outdoor education, and therapeutic outdoor development programs. These programs deserve a closer look.

Outdoor Therapies as Examples

Outdoor therapies are masterful at creating immersive nature experiences that generate a relaxing parasympathetic response. They are equally well skilled at putting clients into situations of perceived risk and small group conflicts to trigger the sympathetic response. A constant condition of one or the other would burn out or bore clients, so the two opposites are alternated and staggered for each client.

Sometimes, clients present with highly activated responses. For example, anxiety, mood, and stress disorders show an overactive sympathetic response and are commonly treated with nature in eco-therapy, known to highlight the parasympathetic response. Eco-therapy is highly immersive and allows for connection with nature, but tends to avoid adventurous challenges. On the other hand, criminality, personality, behavioural, and substance use disorders show a complacent parasympathetic response and are frequently addressed with conflict-rich and risk-based adventure therapy, which are known to elevate the sympathetic response. This takes place in nature, but the programming tends to emphasize challenge.

In fact, the evidence from research literature points to a clear division between both outdoor therapies (Canadian Outdoor Therapy & Healthcare [C.O.T.H.], 2021). Adventure therapy utilizing challenges seems to have been focused on behavioural concerns, while eco-therapy utilizing nature appeared centred on emotional issues. Authors have called for a blended approach to outdoor therapies, especially for wilderness programs (Hoag et al., 2014).

For example, a blended approach may be useful in the treatment of post-traumatic stress disorder (PTSD) because it confounds both behavioural concerns and emotional issues, as do many psychological disorders. PTSD is common in people who have experienced or witnessed a traumatic (and potentially violent) event such as combat, assault, rape, or car crash. The treatment of PTSD in military ice veterans has included eco-therapy with

just nature immersion (Poulsen et al., 2015), adventure therapy with just challenges (Dustin et al., 2011), and both blended with nature and challenge together (Hawkins et al., 2016; Mowatt & Bennett, 2011). Clearly, complex trauma requires more than only one approach.

Indigenous land-based healing is an example of where both challenges and nature can be integrated in a form of outdoor therapy that can serve as a model for other outdoor learning (Redvers, 2020; Johnson-Jennings et al., 2020). Integrated land-based healing programs have cultural journeys, challenging travel across ancestral lands, and camp-based traditional practices, such as foraging for medicines, harvesting plants, and hunting animals for food (Ritchie et al., 2014). Even

nature immersion in land-based healing has inherent challenges and challenge is steeped in unavoidable and enjoyable nature (Priest, 2022).

Conclusion

Outdoor learning is known to have a wide range of beneficial outcomes (Twohig-Bennett & Jones, 2018) derived from challenges and nature as summarized in Table 1. Challenges come in the form of exercise hardships, overcoming perceived risks, and resolving group conflicts. Nature comes in the form of deep immersion, art or science activities, and mindfulness contemplation. The subsequent benefits are grouped under the six ecohealth dimensions.

| OUTDOOR ACTIVITY | BENEFICIAL OUTCOME | ECOHEALTH DIMENSION |
|---------------------------|--|--------------------------|
| Challenge: TOUGH EXERCISE | Cardiovascular endurance, immunity, life expectancy (↑), while body mass, illnesses, injuries, mortality (↓), & fortitude, courage, endurance, resolve, tenacity, perseverance | PHYSICAL fitness |
| Challenge: PERCEIVED RISK | Confidence, resilience, managing fear, risk taking propensity, locus of control clarity, (SELF- concept, efficacy, esteem, calming) | SELF-IMAGE & EMOTIONAL |
| Challenge: GROUP CONFLICT | Conflict resolution, communication, trust, cooperation, collaboration, supporting others, problem solving, decision making | SOCIAL & INTERPERSONAL |
| Nature: DEEP IMMERSION | Restoration, rejuvenation, renewal, deficit replacement, stress recovery, relaxation | MENTAL wellness |
| Nature: ART & SCIENCE | Knowledge, conservation actions, pro-environmental behaviours, protection | ECOLOGICAL understanding |
| Nature: MINDFULNESS | Affinity, kinship, recognize universal role with respect to planet, cosmos, and deities | SPIRITUAL comprehension |

Table 1: Ecohealth and Beneficial Outcomes of Outdoor Learning

In the autonomic nervous system, the sympathetic response kicks in at times of social threat (fight for group conflicts) and personal danger (flight from risk taking or hardship). The distress from adventurous challenges often activates the sympathetic

response. The contrasting parasympathetic response kicks in at times of immersion (connection with nature), activities (cognition), and mindfulness (reflection on experience). The eustress from reflection on action, environmental connection, and

thinking about ecological knowledge often activates the parasympathetic response while mindfully immersed in nature.

This article has argued for “reflect and connect” nature periods to be intermingled with “fight or flight” challenge episodes in outdoor learning. The argument has been made pedagogically and physiologically. Practitioner recommendations have been shared and model examples provided. Nevertheless, only people who understand themselves and know how to work with others (adventurous outdoor learning outcomes) and who have a meaningful and relevant understanding of natural ecosystems and reciprocal human impacts (environmental outdoor learning outcomes), are in a position to understand their place in the world and do something about the big planetary problems faced by the human race. Integrated outdoor learning is the only pedagogy that is poised to create these necessary change agents. Practitioners can help make this dream come true by integrating and alternating challenge and nature.

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Backed By Bees Hive Program: A Buzz-Worthy Initiative in Public Spaces

By Vincent Sowa

The increasing global awareness about the importance of bees, pollinators and their role in our ecosystem has sparked innovative approaches to conservation. One such initiative gaining traction in Ontario malls and schools is the Backed By Bees Hive Program, an inventive partnership between urban spaces and nature. This initiative, spearheaded by Backed By Bees, is designed to reconnect urban dwellers and students with the vital role pollinators play, all while encouraging responsibility and environmental stewardship.

The Concept Behind the Hive Program

At its core, the Backed By Bees Hive Program focuses on placing beehives in accessible urban areas, like malls and in schools across Ontario. The idea is simple yet powerful: businesses and schools sponsor beehives, which are installed in high-visibility locations. These hives create opportunities to raise awareness about bees' importance and foster a connection between urban communities, students, and nature.



One of the most exciting elements of the program is the integration of interactive displays. Hives are accompanied by educational signage and interactive technology, allowing people to learn more about pollinators and their vital role in our ecosystem. Whether it's through informative displays, live streams of the bees, or QR codes that link to online resources, these

displays transform a simple beehive into a dynamic educational experience. Visitors to malls and students in schools can engage with the content, making it a more memorable and impactful learning experience.

Project Goals

The Backed By Bees Hive Program has several key objectives that drive its mission:

Raise Pollinator Awareness: The first goal is to inform the public, particularly urban populations and students, about the critical role of bees and pollinators. By placing hives in malls and schools, the program reaches a wide audience, sparking curiosity and discussions about environmental sustainability.

Create Urban and Educational Biodiversity: Urban areas and schools are often not considered biodiversity hotspots, but this program aims to change that. By introducing beehives into these spaces, the program helps promote a healthier environment where both pollinators and plants can thrive, creating a ripple effect that benefits local ecosystems.

Promote Corporate and Educational Engagement: The program is designed to engage both corporate sponsors and educational institutions. Companies sponsoring hives can align themselves with sustainable practices and improve their corporate social responsibility (CSR) profiles. Schools, on the other hand, can use the program as a unique educational tool, giving students hands-on learning experiences about ecology, biology, and conservation.

Produce Local, Sustainable Products: The honey produced by the urban and school-based hives is a direct result of the bees' work. This honey is used in various

ways, from corporate gifts to school projects, helping to further connect communities with the natural processes they are supporting.

Foster Interactive Education: Through the program's interactive displays, visitors and students can learn about bees and their significance. This educational component is a core feature of the Hive Program, ensuring that the initiative does more than just place hives; it actively informs and educates the public. The interactive elements cater to all ages, making them accessible for both children and adults, whether at a mall or in a classroom.

Expanding to Schools: Engaging the Next Generation

A significant expansion of the Hive Program is its introduction to schools, where it serves as both a living lab and a tool for environmental education. Students can observe the workings of a beehive up close and personal. Teachers can use the program to supplement lessons in biology, ecology, and environmental science, offering a real-world example of the topics discussed in class.

The inclusion of schools in the program also emphasizes the importance of educating the next generation about pollinators. By fostering this awareness early, Backed By Bees aims to cultivate a sense of environmental responsibility that students will carry with them into adulthood. The Hive Program, therefore, becomes a long-term investment in both environmental sustainability and education.

Positive Public and Educational Response

The sight of a beehive in a mall often catches shoppers off guard in the best way possible—it sparks curiosity and invites people to stop, look, and learn. Mall visitors and students are eager to interact with the displays, and many are surprised at how much they didn't know about bees and their vital role in the environment.

Corporate sponsors appreciate the program's direct and visible impact on the community.

Many businesses report positive feedback from employees who are proud to be associated with such a forward-thinking initiative. Moreover, sponsoring a hive offers a unique CSR opportunity that goes beyond simple philanthropy—it's an active contribution to environmental conservation.



Schools, too, have responded enthusiastically to the program. Teachers find the interactive displays and real-life examples to be an invaluable supplement to their curriculum. Students are often excited by the opportunity to see bees up close and gain a deeper understanding of nature's interconnectedness.

Conclusion

The Backed By Bees Hive Program is an ambitious and innovative initiative that bridges the gap between urban life, corporate responsibility, and environmental education. By placing hives in malls and schools and linking them to interactive educational displays, Backed By Bees is fostering a greater understanding of the role pollinators play in our world. This program not only benefits the environment but also enriches the communities and students it reaches, creating a ripple effect of awareness and conservation.

Vincent Sowa is a co-founder of Backed By Bees. He focuses on developing innovative programs like the Hive Program, linking sustainable beekeeping to educational experiences. Backed By Bees is always open to new program partners. Vincent can be reached at info@backedbybees.com.

The Mushroom

By Adelle Purdham

Working together, trees and fungi may live for many hundreds of years. The two are co-dependent, one offering what the other does not have. The trees provide their sugar as sustenance and their carbon, which fungi convert and store in the soil. The fungi offer the trees life-sustaining minerals and extend the reach of the tree's roots, allowing them to take in more water.

Trees also need to communicate and swap nutrients with one another, and they do so through an underground fungal network known as the mycelium. The mycelium is a mass of threads with trillions of end branches that functions similarly to the neural pathways in our brains. Trees send chemical compounds and electrical impulses through the fungi, a flowing underground root river. When trees grow together, connected by the mycelium, nutrients and water can be divided optimally between them so that each tree can grow to be its best self. The stronger trees share their resources with the weaker trees, and when the strong become sick, they are in turn looked after by the weaker trees. Trees understand that every tree suffers when we look out only for ourselves, and every tree is valuable to the community. A tree can be only as strong as the forest that surrounds it.

Trees depend on fungal networks (the mycelium) to survive, and the mycelium's flower is the mushroom.

At the cottage, I walk my dog to the top of the gravel driveway, where it's flat. I'm meandering, thinking about my day, while rust-coloured, seven-month-old Louie tears around up ahead of me, then drops behind, nose to the ground. I pivot at the top of the long drive, as I usually do, and in the next step, the next breath, I catch sight of a magnificent mushroom. Its top reminds me of a frisbee, flat and round. I marvel at its creation, its size, and the very fact of its being. Snap. In an instant, the mushroom I'm admiring is destroyed, its life incidentally obliterated by my Vizsla, who glided right on

by me and, with one careless step, toppled the formidable fungus, leaving its fragile stem snapped at the base. Am I meant to feel something? What does the mushroom's demise mean? My immediate gut reaction is one of partial regret and wonder: partial in that I am not overly attached to this mushroom, and regret because the mushroom will now cease to grow owing to the chance encounter with us stumbling into its path. I wonder at my own ...is it anger? Disappointment? I feel conflicted at the mushroom for not defending itself better. Now why would you go and grow a flimsy neck like that when you have such a big head? I blame the victim. The mushroom was brave enough to grow in the heart of the driveway, but why would it do such a thing? Why didn't it hide, protect itself better? It's a wonder a toadstool can survive at all with wild animals stalking about, taking a simple stroll and cutting them down with the graze of bare knees.

I'm angry at the mushroom, but am I not also angry at myself for being part of the destruction? For being vulnerable in and of my own right? At realizing that I, too, hold a large and heavy head atop a flimsy neck, and that one day, it could snap. Or is it my maternal instincts kicking in, grieving the loss of a life in the way only a mother who has created and nurtured it can?

What a delicate life the fungi lead—are we so different?

*Adelle Purdham is a writer, teacher, and parent disability advocate. She holds an MFA in Creative Nonfiction Writing from the University of King's College and is a writing instructor at Trent University. Adelle lives with her family in her hometown of Peterborough/Nogojiwanong, Ontario. Her debut book, *I Don't Do Disability and Other Lies I've Told Myself* (Dundurn Press, 2024) is a collection of personal essays exploring relationships and disability parenting through the eyes of a mother to a daughter with Down syndrome.*

Outdoor Magic: The Power of Nature Connection

By Jacob Rodenburg

A review of G.D. Linney's *Outdoor Magic: The Power of Nature Connection* (FriesenPress).

How can we teach children about the wonders of the world from within the confines of four walls?

In a world where the average child spends over 2,738 hours in front of a screen each year (1.5 times the hours of a typical 9 to 5 job), this question is more pressing than ever. Thankfully, Grant Linney's *Outdoor Magic* offers a refreshing perspective on reconnecting children (and ourselves), to the outdoors.

Through personal stories, reflections, and compelling arguments, Grant emphasizes the pressing need for outdoor education in today's fast-paced, screen-driven world.

The book *Outdoor Magic* is divided into four parts. The first section consists of colourful and beautifully described anecdotes of Grant's experiences in nature. Encounters with injured birds and early morning wild walks opened his eyes to the tremendous diversity of life. From travelling across Canada by train as a teenager to snowshoeing on James Bay, and from trying his hand at being a "moose whisperer" to canoeing northern rivers, Grant's vivid descriptions remind us of the joy and wonder found in nature, whether through grand adventures or small, intimate moments.

In the second section, Grant shares powerful vignettes from his career as an outdoor educator. His stories are both entertaining and insightful, illustrating how creativity can help children grasp complex concepts, like the connection between trout and trees, or how drama can help kindergarteners understand changes in states of matter. Whether he's recounting his experience raising orphaned baby raccoons or the impact of a simple "sit spot" on his students, Grant's

accessible writing is always colourful and engaging.

In the third section, Grant shares his previously published opinion pieces on why we need outdoor education and he offers up some practical and well-considered suggestions on how this might be remedied based on his decades of experience in the field.

Lastly, Grant curates a selection of powerful quotes from writers, thinkers and educators about why nature matters and how important environmental education is in creating an ethic of caring and stewardship for our Earth.

Overall, I thoroughly enjoyed reading *Outdoor Magic: The Power of Nature Connection*. Grant offers us such vivid and captivating stories. I'm impressed with Grant's recollection and how beautifully, and with humour and love, he brought these stories to life.

The book *Outdoor Magic* is a must read for teachers, administrators, parents and grandparents, community leaders and both aspiring and seasoned outdoor educators. Grant shows us that good environmental education begins with nurturing a love for the very spaces we occupy. His own experiences, shared in such a relatable and impactful way, illustrate that fostering love, wonder, and appreciation for life itself must be an integral part of our education system. We were born to connect to the outside world. That is where the magic is.

Jacob Rodenburg is the executive director of Camp Kawartha, a summer camp, and outdoor and environmental education centre. He teaches environmental education at Trent University and is the co-author of the Big Book of Nature Activities and the author of the Book of Nature Connection. His passion is to find creative ways to connect children with nature.

Why the Deer Spirit

By Armand Garnet Ruffo

What became clear to me as my roots grew and I came into consciousness upon thinking and listening to elders and artists and thinkers over the years was that the newcomers to Turtle Island encountered a belief system so far outside of Western philosophical tradition that it was unrecognizable to them. In their ignorance they quickly dismissed it as primitive and without purpose or worth, and in doing so they dismissed an ancient body of knowledge about the natural world that Indigenous people worldwide have drawn upon to find connection to all living things - a fundamental ethos defining our space and place in the world.

We are currently living or better to say non-living with the consequences of this rejection.

*Armand Garnet Ruffo is an Anishinaabe writer from Treaty #9 territory in northern Ontario. A recipient of an Honorary Life Membership Award from the League of Canadian Poets and the Latner Griffin Writers' Trust Poetry Prize, he is recognized as a major contributor to both Indigenous literature and Indigenous literary scholarship in Canada. His publications *Norval Morrisseau: Man Changing into Thunderbird* (2014) and *Treaty #* (2019) were finalists for Governor General's Literary Awards. He teaches at Queen's University in Kingston, Ontario. "Why the Deer Spirit" is from Armand's recent publication, *The Dialogues: The Song of Francis Pegahmagabow*, a poetry collection released earlier this year by Wolsak & Wynn. It brings to life not only the story of the famed WWI Indigenous sniper, but also the complexities of telling Indigenous stories.*

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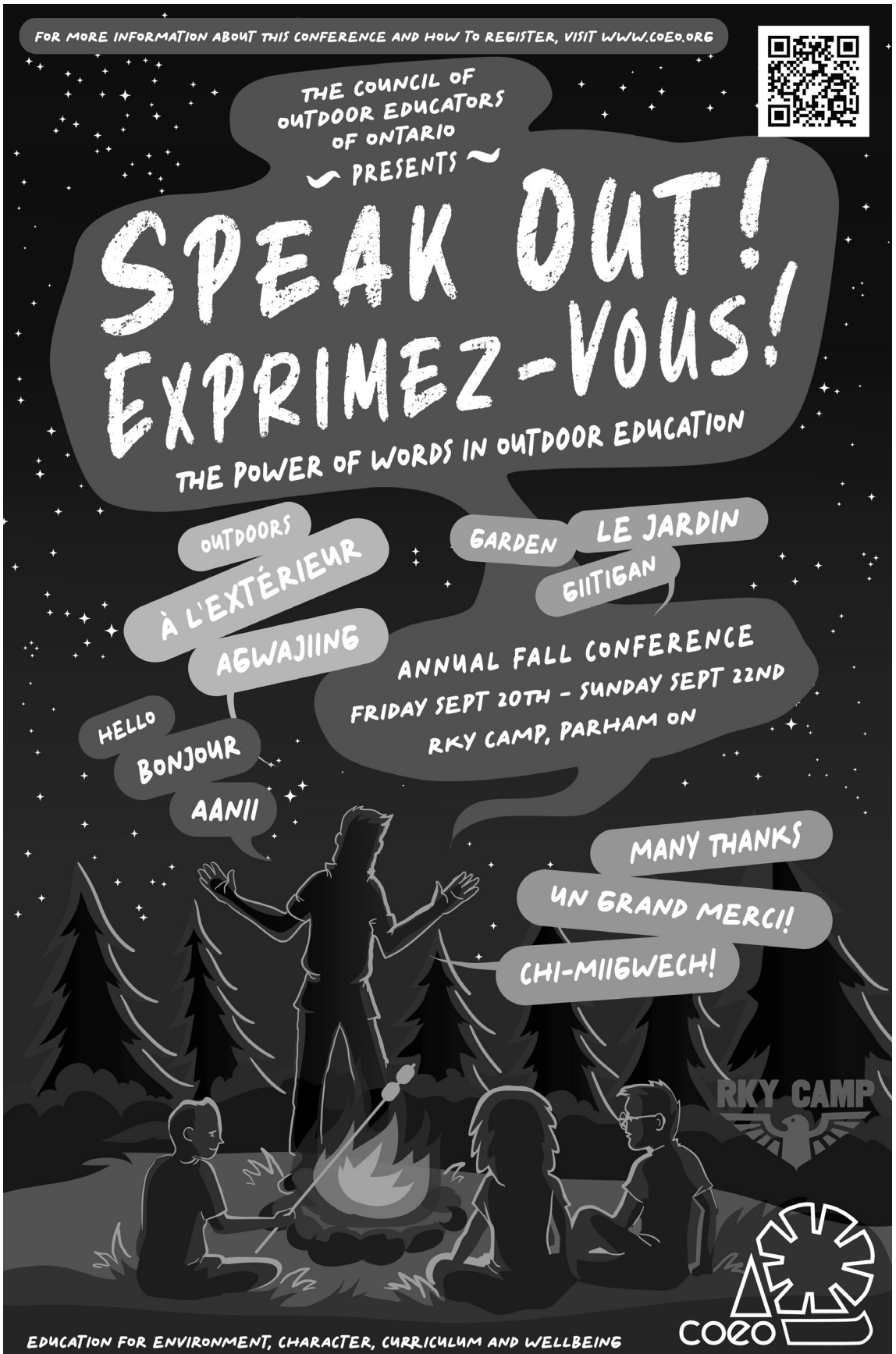
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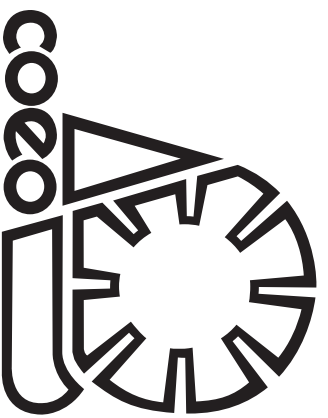
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