


Using Their (Photo)Voice: Student Experiences with Nature-Based Physical Activities In and Beyond Physical and Health Education

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Article abstract

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USING THEIR (PHOTO)VOICE: STUDENT EXPERIENCES WITH NATURE-BASED PHYSICAL ACTIVITIES IN AND BEYOND PHYSICAL AND HEALTH EDUCATION

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ABSTRACT

This study employed a participatory action research methodology, Photovoice, to explore the experiences of adolescent students while learning nature-based physical activity (NBPA) in, and beyond, Physical and Health Education (PHE). Students were asked to take photos both within PHE lessons and outside of school, and write captions to analyze their photos, as part of a unit entitled NBPA in Pictures. Findings indicated that through the NBPA in Pictures unit in PHE, students were able to: connect to both place and others within PHE and outside of school; overcome challenges to being active in nature; describe nature's impact on their body and being; and, gain the desire to inspire others to enjoy nature.

KEY WORDS: Health; Experimental learning; Nature-based physical activity; Photovoice; Physical and Health Education; Youth

INTRODUCTION

Since all youth spend a large proportion of their time in school, the school domain can play an important role in promoting daily health and physical activity for all children. Physical and Health Education (PHE), in particular, stands in an advantageous position for promoting the benefits of leisure and lifetime physical activity as well as healthy behaviours as it addresses young, diverse, and captive audiences (van Beurden et al., 2003). Lifetime activities are those that people continue to participate in throughout life and in their leisure time because they can be done individually or with others, require little organization, and

minimal equipment (Fairclough et al., 2002). Many of these activities occur outside and in nature: walking, running, hiking, swimming, etc.

Although PHE curriculums across North America state lifelong physical activity as a goal, this goal is not always delivered in an explicit manner to students in a way that helps them make the connection between being physically active in PHE and being active in the community where they live. Importantly, through PHE, young people can experience a wide variety of physical activities, and it is these experiences that may determine future involvement in physical activity during leisure time and throughout the lifetime (Hagger et al., 2003). However, for many young people, their engagement with physical activity outside of school is antithetical to the physical activity experiences provided to them through their formal PHE curriculum (Macdonald, 2003). Additionally, there is relatively little research outlining how PHE teachers can effectively orient young people toward participation in regular leisure-time physical activity outside of school (Polet et al., 2019).

One way to help students make the connection between PHE and physical activity outside of school is to elicit student voice. Student voice “describes the many ways in which youth actively participate in the school decisions that shape their lives and the lives of their peers” (Mittra, 2007, p. 727). Many researchers within the field of PHE have identified the importance of including student voice in pedagogy and research (Gibbons et al., 2010; Gruno & Gibbons, 2016; Fisette, 2012; Wattchow et al., 2014). Student voice is about more than just listening to students; it is about listening to students with the intent of responding to what we hear (Cook-Sather, 2007; Fielding, 2004). One way to directly involve students in sharing their experiences in PHE is through participatory action research.

The purpose of this study was to help students in PHE, through participatory action visual research, make a connection between nature-based physical activity (NBPA) in PHE and being active in nature outside of school. Nature-based physical activities are those that are done in natural areas, require little specialized equipment, deemphasize competition, are cost-efficient, and can be implemented by teachers on a regular basis (Gruno & Gibbons, 2020, 2021, 2023, 2024). NBPA can influence the promotion of physical activity by redesigning the PHE curricula to promote out-of-class physical activity, modify the school environment so students have opportunities to be active on campus outside of PHE lessons, and work to develop physical activity linkages in the community (McKenzie & Lounsbery, 2014). Additionally, NBPA can help students realize some of the many benefits of learning outdoors: developing outdoor-living skills, risk and challenge, gaining environmental knowledge, personal growth and leadership skills, sense of community, building connections, and having fun in nature (Purc-Stephenson et al., 2019). Two research questions were addressed in this study: What were the experiences of adolescent students while learning NBPA in PHE? How did they relate these experiences within PHE with being active in nature outside of school?

METHODS

Participatory action research emphasizes “research for change and the development of communities” (Tandon, 2005, p. 37). Participatory methods are those that facilitate

participants in finding their own language to articulate what they know and help them put words to their ideas and share understandings of their worlds, thereby giving participants more control over the research process (Enright & O'Sullivan, 2012). Most often participatory methods are practical activities, which are considered engaging, enjoyable, and relevant ways for students to engage in research and generate data (Enright & O'Sullivan, 2012). Participatory methodologies have been widely praised as facilitating the active participation of students in research. Facilitating students in "learning to derive meaning from themselves and the world around them" (Kincheloe, 2007, p. 745) and promoting enjoyment and relevance for students (Barker & Weller, 2003). In participatory action research, the end goal is to involve participants during the entire research project (Wang, 1999). Within the field of PHE, several studies have previously explored how participatory action research can support students having their voices heard about their experiences in PHE (Enright & O'Sullivan, 2010; Lamb et al., 2018; Oliver & Hamzeh, 2010; Oliver et al., 2009). One aim of this study was to work with students to disrupt the perceived boundaries of what is possible in PHE, imagine what is possible, and work towards what could be (Oliver et al., 2009).

Increasingly in the literature, we are seeing examples of participants producing their own visual representations as part of participatory action research. Participatory visual research is an area of research where contributions are made in an effort to influence policy. The use of photography in Photovoice, participatory video, digital storytelling, drawing and mapping have all been shown to be effective in engaging community participants, and especially in altering some of the typical power dynamics related to the researched/researcher, and to ensuring spaces for marginalized populations to both speak about and then speak back through interactive workshop sessions to social conditions. The products, photo exhibitions or YouTube videos for example, are ideally suited to be seen (Mitchell et al., 2018). Student drawings have been used to access students' experiences and perceptions of PHE (Goodwin & Watkinson, 2000) and physical activity in their communities (Sharpe et al., 2004). Oliver et al. (2009) employed student photography as a tool to facilitate students identifying what prevented them from being active. Given the intention to collaboratively investigate students' experiences of NBPA, build a supportive community, and promote positive change for students in PHE, the participatory visual research methodology, Photovoice, was selected for this study.

Photovoice was designed by Wang and Burris (1997) to shed light on various global public-health issues based on the assumption that people are the experts of their own lives. In Photovoice, participants use cameras to document their lived experiences and take a critical view of the world around them in an effort to advocate for social change in their own community at the grassroots level (Wang et al., 2004). Photovoice is an empowerment tool because it gives a voice to those who typically do not have a say in shaping policy, and it emphasizes both individual and community action (Wang, 1999). Photovoice has begun to be used in educational research and is valuable because it is an engaging tool for both teachers and students. Using Photovoice, teachers can learn more about their students' experiences within PHE and their lives outside of school, and students feel valued because their voice can be heard by their teachers, classmates, and policy makers.

Photovoice puts cameras into the participants' hands to help them to document, reflect upon, and communicate issues of concern, while stimulating social change (Wang & Burris, 1997). Photovoice can enhance community engagement, increase awareness of community resources, and foster self-efficacy of the research partners (Israel et al., 2010). The premise is that visual images are powerful representations of individuals' experiences, sometimes in ways that language is not (Parker et al., 2016). Photovoice participants are responsible for the inquiry's direction by capturing photographs they consider central to their experiences, being given the chance to engage in sense-making with their peers and being encouraged to be critical. Therefore, the goal of Photovoice studies is to empower participants to advocate for their own and their community's well-being (Rivard & Mitchell, 2013). Additionally, Photovoice can support critical thinking, self-reflection, discovering strengths and social support (Halvorsrud et al., 2019).

Previous studies have outlined the value of Photovoice for students in PHE (e.g., Enright & O'Sullivan, 2012; Treadwell & Taylor, 2017), PHE in-service teachers (e.g., Parker et al., 2016), PHE pre-service teachers (e.g., Langdon et al., 2014; Walker et al., 2017), and PHE teacher educators (e.g., Parker et al., 2016). Some of the benefits reported by these studies include participant "honesty, learning, enjoyment, confidence, ownership, and empowerment" (Enright & O'Sullivan, 2012, p. 49); as well as authentic engagement, discussion, and reflection, and articulation of implicit views (Parker et al., 2016). The favourable experiences of participants in these and other Photovoice studies epitomize the reasons we felt Photovoice was the participatory action research method best suited to the research questions. Sharing photographs gave the students something tangible to talk about, helped them get to know each other on a different level, and share experiences they might otherwise have struggled to put into words. Moreover, others have noted that Photovoice studies can be fun (Enright & O'Sullivan, 2012), and enjoyment and meaning for our adolescent participants and their teachers was important to us. When considering NBPA, one benefit of being active in nature is engagement with all the senses, therefore, using a visual methodology to capture the students' use of sight in nature was powerful.

Wang (2006) identified nine steps in implementing a Photovoice study: Select and recruit a target audience of policy makers or community leaders; recruit a group of Photovoice participants; introduce participants to the Photovoice methodology and facilitate a discussion on cameras, power, and ethics; obtain informed consent; pose initial theme(s) for taking pictures; distribute cameras to participants and review how to use the camera; provide time for participants to take pictures; meet to discuss photographs and identify themes; and, plan with participants a format to share photographs and stories with policy makers or community leaders. The specific methods for this study are outlined below, and they align to Wang's (2006) steps.

PARTICIPANTS

Participants in this study included two PHE teachers and 34 students. The two teachers involved in this study are members of an ongoing schools-university partnership, a group of 25+ teachers representing six school districts in British Columbia, Canada. A schools-

university partnership has recently been defined as “an enterprise that is jointly created, developed and sustained in the midst of complex settings to advance educational practice, knowledge and understanding” (Day et al., 2021, p. 24). Schools-university partnerships offer a locally driven, collaborative approach to educational improvement and transformation, in which researchers and teachers pursue improvement goals they define together, drawing on the expertise of each partner (Coburn et al., 2021). The two participating teachers helped to design, implement, and assess the Photovoice project with their PHE students.

During our schools-university partnership’s annual meeting, we briefly described the *NBPA in Pictures* unit to all the teacher members. All members of the partnership were then invited to participate in the project. Many teachers expressed interest in implementing the unit and two chose to participate in this study and emailed regarding their interest; Aria and Emma (pseudonyms). The sampling techniques for this study were a combination of convenience and purposeful (Creswell, 2013); convenience in that the teacher participants were easily accessible due to the partnership, and purposeful in that the teachers were selected from the ongoing schools-university partnership because they had been involved in previous NBPA research (e.g., Gruno & Gibbons, 2021) and have dedicated their teaching of PHE to focus on the meaningful inclusion of nature. We provided Aria and Emma with a framework (see Figure 1) and explained that the unit would be a collaboration between the research team, them, and the students. The NBPA content within the unit framework was informed from previous studies (Gruno & Gibbons, 2022, 2023, 2024).

All the students in one of Aria’s and two of Emma’s PHE courses participated in the *NBPA in Pictures* unit as each teacher provided the unit as a part of their overall PHE curriculum. However, we only collected data from the students who consented to be a part of the Photovoice study; 31 of Emma’s students and 3 of Aria’s students. These participants, and their guardians, consented to their photos being shared in research articles. We used pseudonyms for all students and both teachers throughout the study to identify their contributions and to protect their identities. The researchers, students, and teachers, were all participants in this process; Aria, Emma and the two authors of this paper occupied the role of adult allies (Enright & O’Sullivan, 2012), fostering the students’ capacities to reflect on their time being active in nature both within and beyond their PHE class. All participants planned the unit together. See Figure 2 for information provided to students prior to the unit and the choice survey that provided the means of gathering student input in the design of the unit. The students then collected and helped to analyze the data by taking photos and writing captions.

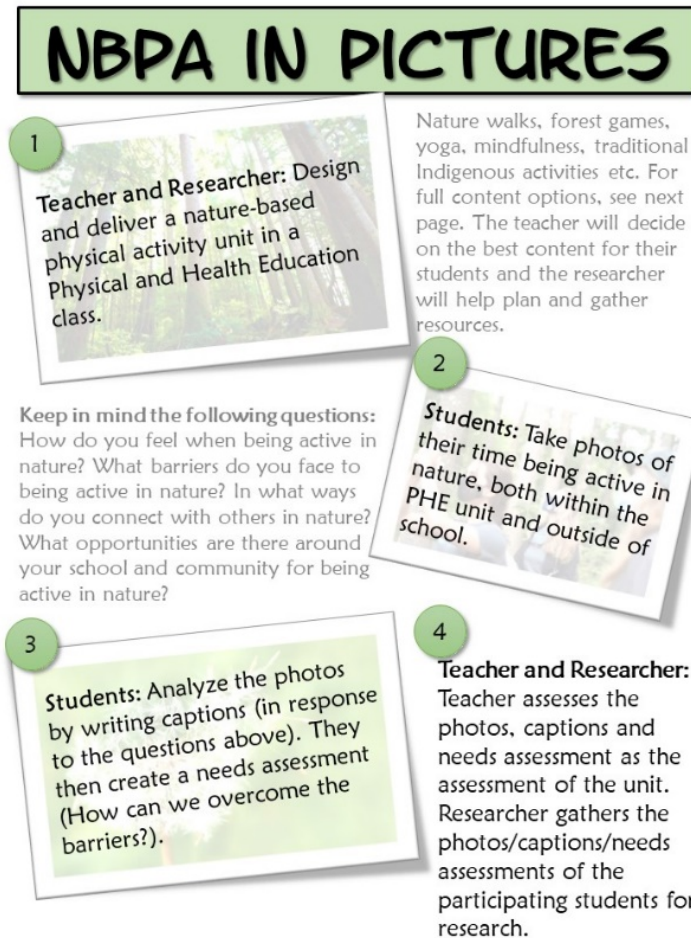


Figure 1. The NBPA in Pictures Unit Framework Provided to Teachers

DATA COLLECTION AND ANALYSIS: THE NBPA IN PICTURES UNIT


The data collection steps in this study closely mirror steps 3-8 outlined by Wang (2006).

Step 1: Select a Topic

This study explored the students' experiences with NBPA both within the PHE class and outside of class time. Weeks before the unit took place, each teacher described the *NBPA in Pictures* unit to the students and gathered their input in designing the unit by asking them to rank the top NBPAs they wanted to learn (Figure 2). Aria's students selected local hikes, outdoor mindfulness/forest bathing, geocaching, outdoor yoga, forest games, knot tying, survival skills and gardening as their top activities. Emma's students chose local hikes, survival skills, geocaching, and forest games as the NBPAs they were most interested in learning.

Aria and Emma approached the unit differently. Aria, who teaches at a large public school of approximately 1700 students, had several vulnerable youth in her all female identifying PHE 10 class. She created a three-week unit, based on the students' interests that centred on NBPAs on or close to school grounds (Figure 3).

NBPA IN PICTURES



You are invited to participate in a study entitled *Using their (Photo)voice: Student experiences with nature-based physical activities in and beyond Physical and Health Education.*

For the next 2-4 weeks, we will be participating in nature-based physical activities both within Physical and Health Education and outside of school. **Nature-based physical activities** can be done in local natural areas and require little specialized equipment; can be done by the majority of people, are cost-efficient and can be participated in regularly and throughout the life-span.

During your participation in these activities, you will be asked to take a number of photos. These photos can be of yourself (selfies or ask someone else to take the photo of you), or of natural surroundings. When taking these photos, allow these questions to guide you:

- How do you feel when being active in nature?
- What barriers do you face to being active in nature?
- In what ways do you connect with others in nature?
- What opportunities are there around your school and community for being active in nature?

You will then be asked to submit a few photos to your teacher. When submitting these photos, you will also need to write captions in order to tell your audience what each photo is all about. Use the template provided to you:

1. P = Describe your **photo**
2. H = What is **happening** in your photo?
3. O = Why did you take a picture **of** this?
4. T = What does this picture **tell** us regarding the guiding questions?
5. O = How can this picture provide **opportunities** for **others** to improve their physical activity in nature?


These photos and captions will form part of the assessment for the unit.


NBPA IN PICTURES

Later in the semester we will be participating in a unit called "Nature-Based Physical Activities in Pictures". As part of this unit, we will be participating in several nature-based physical activities on, and around, the school campus. During this time, you will take pictures of yourself being active in nature. Please read over the activity options and select (✓) the **top 5** activities in which you are interested participating.

Nature-based physical activities: can be done in local natural areas and require little specialized equipment; can be done by the majority of people, are cost-efficient and can be participated in regularly and throughout the life-span.

- Forest Games
- Sea Glass Collection
- Indigenous Plant Identification
- Geocaching
- Local Hikes
- Knot Tying
- Orienteering
- Traditional Indigenous Activities
- Scavenger Hunts/Amazing Races
- Outdoor Yoga
- Outdoor Mindfulness/Forest Bathing
- Teambuilding Activities in Nature
- Disc Golf
- Survival Skills (shelter building, fire starting)
- Gardening
- Nature Identification (trees, clouds, animal tracks)
- Fitness Activities in Nature
- Conservation Activities (beach clean-ups, removing invasive species)
- Other: _____





Questions to think about when being active in nature: How do you feel when being active in nature? What barriers do you face to being active in nature? In what ways do you connect with others in nature? What opportunities are there around your school and community for being active in nature?

Figure 2. Unit Information and Choice Survey Provided to Students

Mon, Sept 20:	Tue, Sept 21:	Wed, Sept 22:	Thu, Sept 23:	Fri, Sept 24:
<i>Walk in the forest and work out</i>	<i>Yoga outside</i>	<i>Yoga presentations outside</i>	<i>Gardening – planting daffodils</i>	<i>Forest game and forest bathing</i>
Mon, Sept 27:	Tue, Sept 28:	Wed, Sept 22:	Thu, Sept 23:	Fri, Sept 24:
<i>Scavenger hunt</i>	<i>Survival skills – knots and fire starting</i>	<i>Survival skills – Shelter building</i>	<i>NO SCHOOL</i>	<i>Forest walk and forest bathing</i>
Mon, Sept 20:	Tue, Sept 21:	Wed, Sept 22:	Thu, Sept 23:	Fri, Sept 24:
<i>Geocaching</i>	<i>Final yoga session</i>	<i>Flex day</i>	<i>Nature Bingo</i>	<i>Hiking field trip</i>

Figure 3. Aria's NBPA in Pictures Unit Plan

Emma, on the other hand, teaches at an independent school of approximately 400 students. She chose to run a two-week unit (Figure 4), with a mixture of on and off campus activities. Since her school has a fulltime bus driver, she was able to explore local natural areas as part of her unit.

Mon, Sept 27	Tue, Sept 28:	Wed, Sept 29:	Thu, Sept 30:	Fri, Oct 1:
<i>NO SCHOOL</i>	<i>Hike base trails of local mountain</i>	<i>Geocaching on school campus</i>	<i>NO SCHOOL</i>	<i>Lawn games and shelter building at local beach</i>
Mon, Oct 4:	Tue, Oct 5:	Wed, Oct 6:	Thu, Oct 7:	Fri, Oct 8:
<i>Hike technical & steep routes of local mountain</i>	<i>Capture the Flag at local lake</i>	<i>Orienteering on school campus</i>	<i>Geocaching on local mountain</i>	<i>Forest games in park adjacent to school grounds</i>

Figure 4. Emma's NBPA in Pictures Unit Plan

As Treadwell and Taylor (2017) outlined, the topic of a Photovoice project should center on an issue that impacts the class, the school community, or society. The NBPA innovation in PHE impacted both the class level and the community/society level as students had the opportunity to identify ways to be active in their natural community as well as identify environmental issues. Each teacher made it clear that their students should not alter anything about how they lived their lives for the duration of the unit, as the photos needed to tell the 'real story.' As honesty is of utmost importance for accuracy, we and the teachers were careful to foster a positive and judgment-free learning environment.

Step 2: Taking the Photos

All the secondary school student participants owned a cell phone with camera capabilities. Therefore, they used their phones to document their experiences with NBPA both within class and outside of school for the duration of the unit. Moreover, both teachers went over social responsibility as it related to digital photography prior to starting the *NBPA in Pictures* lessons. All photos were taken within the PHE lessons or outside of the school day to not disrupt the learning environment of the school.

Students were provided with questions at the beginning of the unit that guided their photo taking (Figure 2):

1. How do you feel when being active in nature?
2. What barriers do you face to being active in nature?
3. In what ways do you connect with others in nature?
4. What opportunities are there around your school and community for being active in nature?

Step 3: Selecting and Analyzing the Photos

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The teachers each instructed students to take several photographs over the course of the unit, both within the PHE lessons themselves and outside of school time. Each photograph had to respond to one of the guiding questions. Students in Aria's class had to submit at least one photograph per week whereas students in Emma's class had to submit all their selected photos at the end of their two-week unit. Alongside each photo, students had to analyze the photo by writing a caption. For this portion of the analysis, students were asked to use an adapted version of Amos et al. (2012), PHOTO, an acronym for a series of questions that the students answered as they wrote their captions:

1. P = Describe your **photo**
2. H = What is **happening** in your photo?
3. O = Why did you take a picture **of** this?
4. T = What does this picture **tell** us in regard to the guiding questions?
5. O = How can this picture provide opportunities for **others** to improve their physical activity in nature?

The teachers encouraged the students to think about each photo on a deeper level with each answered question. This instructional process not only engaged the students in the content of the lessons, but also enabled students to look critically at the world around them.

The data used in this study included observational notes taken by the lead author during the meetings with the teachers and students, the teachers' preparation materials, the photographs taken by the adolescent students as well as the captions they wrote. The thematic analysis was conducted as proposed by Braun and Clarke (2006). Themes were identified using an inductive approach in which they emerged from the data rather than trying to accommodate themes to a framework (Braun & Clarke, 2006). To identify the meaning of patterns, the five phases proposed by Braun and Clarke were followed: (a) familiarizing with data, (b) generating initial codes, (c) searching themes, (d) reviewing themes and (e) defining and naming themes. We re-read the notes, materials and the participants' captions several times to identify patterns. To create initial codes, a table was created that summarized every photo and caption. An additional column was then added and dedicated to identifying and summarizing the most basic meaning of the data (Braun & Clarke, 2006). Subsequently, these initial codes were analysed to identify main themes and sub-themes. Finally, themes were refined, and names were created that captured the essence of the identified themes (Braun & Clarke, 2006). No software package was used for the data analysis as it was conducted manually as suggested by Braun and Clarke (2006). For the sake of article length, the complete data table is not included; instead presented in the next section are selected photos and captions to represent each theme.

FINDINGS AND DISCUSSION

Throughout the data collection and analysis, the teachers and researchers learned a great deal about the students' experiences with, and perceptions of, NBPA both within their PHE lessons and outside of school. These findings revealed the interplay between different domains of the adolescents' lives. The students uncovered important insights about their participation in physical activity outdoors. Five salient themes emerged, with subthemes,

and are discussed in detail below. Representative student photos and captions are included within each theme.

“Physical Education Doesn’t Have to be in an Ugly Gym”: Connecting with Place

Many of the participants spoke of the *NBPA in Pictures* unit, and involvement in NBPA more generally, as a conduit for connecting to place. The NBPA unit had students interacting with their local environment and the act of taking photos further engaged their senses. Learning to be comfortable with nature is consistent with Potter and Henderson (2004), who stated that “what needs to be unlearned is a fear of and detachment from nature” (p. 75). As society loses linguistic and cultural diversity, we lose diversity in seeing, thinking, doing, and being; we further weaken our experience of place (Davis, 2009). Current relative uniformity of curriculum and pedagogy reflects this cultural homogenization (Davis, 2009). Furthermore, the shift from learning through direct experience and observation to learning theoretical knowledge has contributed to the uprooting of education’s connection to our environments.

Surinder, one of Emma’s students, writes in their caption to Figure 5 “[This photo shows] that there is a distinct connection to nature when the activity is directly related to the environment, not just a game outdoors”. Previous research (Gruno & Gibbons, 2023) has advocated that NBPAs, to be considered place- or land-based education, are not activities “designed for the gym and simply moved outside.” Another student, Parker, felt that participating in NBPA not only connected them further to place, but also to art as well. “I took the picture because it reminded me of the romantic painting ‘Wanderer Above the Sea of Fog’ by Caspar David Friedrich from 1818, but without the fog. Besides, the view was stunning” (Figure 6).



Figure 5. Surinder’s photo of “A small clearing within the vegetation of the forest”



Figure 6. Parker’s photo of “me, standing on a rock and a wonderful scenery in the background”

At times, the students selected insightfully nuanced elements of their environment to highlight in their photographs. Eoin wrote in his caption for Figure 7, “I took this picture because the spot where the tree is has a very different environmental tone from the rest of the lake.” Similarly, Eloise, in Figure 8 noticed, “Flowers sprouting through the first signs of Fall. I took a picture of these flowers because the pop of colour caught my attention.”



Figure 7. Eoin’s “Portrait shot underneath a tree” at a local lake



Figure 8. Eloise’s photo of “these flowers are helpful reminders... of how pretty nature really is”

Place- and Land-Based Pedagogy

The *NBPA in Pictures* unit, in some circumstances, acted as an introduction to both place- and land-based learning for students thereby helping them to form connections to place. As part of her unit, Amy asked a local Indigenous Elder to translate traditional plants into the local Kwak'wala Indigenous language for use on an Indigenous plant Bingo card. The local words were then learned and used by students within the authentic context of being in the forest. Because Indigenous language is intricately connected to the land (Ormiston, 2014), it is important that the languages are taught where they were traditionally used and generated (Moore, 2003). Land-based learning moves beyond the limited Western perspective offered by place-based learning by centring Indigeneity and honouring the relationships that Indigenous peoples have with the land (Styres et al., 2013). As such, Indigenous-centred land-based learning is a means to promote decolonizing goals through the expressions of active and historical Indigenous resistance to colonial systems (Calderon, 2014; Friedel, 2011). There is a widespread belief that land-based learning must entail being in wilderness. However, important to the context of this study and NBPA in general, land-based learning can occur in both urban and rural spaces because all land on Turtle Island is Indigenous land (Styres et al., 2013; Tuck et al., 2014).

In Lowan-Trudeau's (2014) exploration of the question of how Indigenous ecological perspectives might reshape outdoor learning in Canada, he concluded that "it is already beginning" (p. 361). Later, Lowan-Trudeau (2019) claimed that educators "often experience formidable internal and external challenges" (p. 62) when incorporating Indigenous content into their courses. Lowan-Trudeau (2019) contended that an "inadequate level of pre-service, curricular, resource, and research support" (p. 62) for teachers contributes to some teachers' reticence to include Indigenous content in their courses. One hope from this study is that *NBPA in Pictures* can provide inspiration for incorporating elements of Indigenous land-based pedagogy.

"It is Always Better in a Group - More Fun": Connecting with Others

Nature connectedness, as discussed in the previous theme, is "a predisposition to take an interest in learning about the environment, feeling concern for it, and acting to conserve it, on the basis of formative experiences [in nature]" (Chawla & Derr, 2012, p. 19). Nature connectedness is a strong predictor for both visit frequency to local green spaces and meeting physical activity guidelines in adults (Flowers et al., 2016).

Relatedness

Similar to the idea of nature connectedness, is the idea of relatedness as a strong connection to others and to the natural world can result in a number of benefits for young people (Zelenski & Nisbet, 2014). Many students wrote of how their participation in NBPA, both within PHE lessons and outside of class, created a sense of relatedness. Relatedness is the perception of belonging and feeling connected both to classmates and to educators (Ryan & Deci, 2000). Several studies have shown that engagement with the natural world may not only increase nature connectedness, but also relatedness to others, including prosocial behaviours such as empathy and generosity (Cervinka et al., 2012; Zhang et al., 2014). Nicole in her caption to Figure 9 wrote, "I wanted to show how many people participated in these

outdoor activities. I also wanted to show the dynamic of some of my classmates to show how they get along well and had fun outside.” Previous research highlights the importance of relatedness in PHE (Gibbons, 2014; Gruno et al., 2018; Gruno & Gibbons, 2021).



Figure 9. Nicole’s photo of “a bunch of my classmates scattered around the field” at a lake

Teambuilding

As part of her *NBPA in Pictures* unit, Emma incorporated teambuilding activities such as shelter building on the beach. Many of her students commented how these types of activities made them feel connected to place as well as their classmates. For example, Lauro wrote in one of their captions, “Anything can be achieved through teamwork and communication.” Similarly, Liam’s caption for Figure 10 read “This photo promotes cooperative activities in nature and shows that if you work together, you can achieve more.” Teambuilding challenges, when implemented systematically and purposefully in PHE, have been shown to increase perceived social approval (Gibbons et al., 2018), and learning outdoors, more broadly, has been linked to increasing social cohesion (Gray & Pigott, 2018; Mygind, 2009; Prince, 2020; Scott et al., 2011; Sjöblom & Svens, 2019).

This theme supports previous research in that NBPA, or outdoor learning, has been shown to foster communication, reasoning, and interactional abilities (Breunig et al., 2015), while also enhancing 21st century skills such as resilience (Booth & Neill, 2017; Hayhurst et al., 2015), collaboration (Fägerstam, 2014), conflict resolution and self-regulation (Gray, 2019; Mirrahmi et al., 2011; Sibthorp et al., 2015). Relationships themselves are a common focal point of land-based learning (Bowra et al., 2021). Additionally, Purc-Stephenson et al. (2019)

found that *sense of community* was one key learning outcome of outdoor education programs. Their reviewed studies described how learners fostered emotional bonds and improved communication with their peers, and how learning outdoors taught them how to work collectively to complete tasks. Educators guided this process using group exercises and physical challenges, similar to Emma's shelter building activity that fostered students working together. Purc-Stephenson et al. (2019) described that when learning outdoors, friendships develop as learners share stories and give input as they work together. When displaced in the outdoors together, learners develop interdependent relationships with each other, often providing emotional and tangible support.



Figure 10. Liam's photo of "myself and a couple others...building a structure out of washed-up beach wood"

Fun with Friends

Another thread that stood out within this theme is how much fun students had being active outside with their friends. Elliot wrote in his caption to Figure 11, "This photo tells me that getting outside with friends and taking photos is very fun, and to never underestimate the fun in nature." Similarly, Gemma wrote describing her photos capturing her, her sister, and her sister's boyfriend hiking to a local beach outside of class time: "we were outside getting fresh air and working really hard and having fun!"

This idea of having fun with peers reflects previous research that highlights environments that students value throughout their PHE experiences, ones in which they feel supported socially, so can relax, have fun and become enthusiastic about the activities without the fear of ridicule (Gruno & Gibbons, 2016). Similar to Purc-Stephenson et al.'s (2019) findings, participants in this study appeared to enjoy the more unstructured format of some of the NBPA experiences, which allowed them the freedom to explore and engage with their surroundings and with others. These types of activities are often not interpreted as "learning" because they are physically engaging and novel (Purc-Stephenson et al., 2019). The fact that many students reflected having fun while taking pictures of being active with their friends outdoors, supports the choice of Photovoice as the methodology for this study. Fun or enjoyment is often underrated in research, and the success of the method can hinge

on the ability to engage students with the process (Enright & O'Sullivan, 2012). Additionally, when looking at NBPA as a form of innovation in PHE, a unit like NBPA can be seen as a novel activity situated within a supportive environment, and therefore, can act as a catalyst for change in PHE curriculum (Timken & McNamee, 2012).



Figure 11. Elliot's photo of "my peers standing on a rock" on the top of a local mountain and the "dark contrast with the bright clouds looks cool!"

"I Got Stung by a Wasp, it Wasn't Nice but That's Nature for You": Overcoming Challenges to Being Active in Nature

In their captions, some of the students commented on overcoming the challenges encountered when being active in nature.

Weather

Eloise wrote in her post-unit reflection that, "Sometimes the weather acts as a barrier to me exercising outside. I have planned to go on a walk before, but it was raining too much." Similarly, Katryna wrote in a caption for one of her photos taken during a field trip to a local lake, "one barrier is the absolute cold; we were not prepared for the extreme weather." Stella wrote of one her experiences in *NBPA in Pictures* during a geocaching lesson in her caption to Figure 12, "even though it was rainy and muddy, we still managed to have fun."

Blenkinsop et al. (2016) provided tips to mainstream educators interested in becoming more outdoor, place-based, and experiential in their teaching practices. They advised that effective teachers in the outdoors need to be able to create a shape and rhythm for learning that works with the needs of the students, maximises the affordances of the place where the class is being conducted, and is flexible enough to respond to unknown variables such as weather. Many educators have experienced the disengagement caused by wet, cold students and teachers in previous studies and have noted that students often come to school unsuitably dressed for the weather, making it problematic to take them outside for learning (Oberle et al., 2021). It is important to identify weather as a potential barrier to NBPA as once barriers are identified, strategies for removing barriers can be developed; once support factors are

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identified, they can be further enhanced, solidified, and systematically incorporated into class planning (Oberle et al., 2021). One such support may be resources to address the lack of appropriate outdoor gear among students such as a clothes lending library (Oberle et al., 2021). Students in Scandinavian schools spend approximately three hours each school day outside – rain, hail, snow, or shine – in all four seasons. Despite a climate that would seem to discourage outdoor learning activities (Gray, 2019), Scandinavian educators believe that “there is no such thing as bad weather, only bad clothing” (p. 69).



Figure 12. Stella’s photo of “one of the geocaches we found near” the park

Building Resiliency

Other students in the *NBPA in Pictures* unit wrote of overcoming physical challenges during some of their nature excursions. Santo wrote in his caption of Figure 13 of the success he felt by pushing his limits to reach the summit: “hard work always pays off, whether it's a school project or a hike up a mountain.” Purc-Stephenson et al. (2019) found that this idea of overcoming physical challenges was deemed necessary to help learners explore their environment in new or novel ways, learn to be comfortable in nature, and understand the capabilities of their bodies. Researchers have repeatedly argued that exposure to challenge activities in nature can enhance participants’ psychological resilience (Gray & Martin, 2012; Gray & Pigott, 2018). By employing NBPA as a teaching strategy, elements of risk taking, problem solving and inner mastery emerge as by-products of engaging with natural environments.



Figure 13. Santo's photo of "a stunning view from the summit"

The Accessibility of NBPA

Teachers in previous studies have identified lack of funding, transportation, and accessibility as barriers to implementing NBPAs in their classes (Gruno & Gibbons, 2021; Hall et al., 2020). In Bentsen et al.'s (2010) study on the use of Udeskole (curriculum-based outdoor learning in Scandinavian schools for students aged 7-16), the costs associated with this pedagogy were also identified as the main challenge, particularly for training, additional staff, and transport. Whereas many students in this current study highlighted overcoming challenges during their participation in NBPA in Pictures unit, many others discussed the accessibility of NBPA. Henry, in his caption to Figure 14 wrote:

Small activities in nature such as walks can help us improve our physical activity in nature because they don't take up too much time and can eventually build up good habits...soon enough, short walks will turn into long walks, and you may even try going on a run. Small, baby steps are all it takes to change how active you are in nature.



Figure 14. Henry's photo of "a few of the students walking down the trail" at a lake

As part of another caption for a different photo he explained, "If you enjoy [NBPA], you will go for more, and eventually, going outside will become a daily part of your life, just like how it did to mine." Similarly, Surjeet wrote in their caption for Figure 15, "...this [photo] tells us that there are different levels of difficulty for nature based physical activity, so there is always something for everyone." The use of local green spaces for educational purposes (rather than visiting distant parks, forests, or beaches) has been identified as a key strategy to address challenges associated with funding and accessibility (Bentsen et al., 2010; Edwards-Jones et al., 2018). Khloe, in one of her captions, further elaborated on this idea of the accessibility of NBPA beyond PHE: "There could be some places close to your house where you can do some physical activities." This accessibility means NBPAs are logistically simple and likely school-based or school-adjacent which addresses the common barriers of limited time and budget, and logistics which have been identified by several researchers as primary constraints of learning outdoors in K-12 education (Hall et al., 2020; Mannion et al., 2013; Shume & Blatt, 2019).



Figure 15. Surjeet’s photo of the “less technically challenging trails at [a local mountain]; I took this picture because I thought the way that the sun was shining through the trees was very pretty”

“This Was a Walk that Calmed my Mind Yet Kept my Body Active”: Nature’s Impact on Body and Being

During a class trip to a local beach as part of the *NBPA in Pictures* unit, Leah took a photo of herself “looking out at the water, under a log hut someone made. It was a very nice day, the sun was shining and the leaves were bright and all different colours.” As part of her caption to Figure 16, she wrote, “The sun was like a warm jacket and helped me be calm and mindful.”



Figure 16. Leah’s photo of a “calm beach with the clouds hovering over the mountains, with a bright blue sky”

Katie felt that the NBPA lessons removed her from the stress associated with the school building. She wrote in her caption to Figure 17, “The view was beautiful and it was nice to go out for a walk without the stress of being in a classroom and doing homework.”



Figure 17. Katie’s photo of “a walk around [a local lake]”

Sarat viewed the NBPA lessons as a time to be mindful and use all their senses: “I was trying to relax and make sure to not take these opportunities for granted. I was calm and observant of what was around me.” They believed, “being outside helped change [their] mood” (Figure 18). Similarly, Bella wrote about a bike ride she took with a friend outside of school when it was “pouring rain” and she explained that “It felt really nice tbh [to be honest], it was like free therapy.”

Similar to Purc-Stephenson et al.'s (2019) findings, the participants described the NBPA experiences as a time to remove themselves from the stresses of urban living to reconnect with nature. Students of Indigenous land-based learning have long recognized “land as a place of reflection” (Bowra et al., 2021, p. 136). This experience of “self-in-relation” (Styres et al., 2013) allows for reconnection with not only culture and community, but also with self (Schultz et al., 2016). Our natural environments possess a restorative power; literature shows that outdoor settings ameliorate stress, improve mood, enhance coping ability and assist in combating depression (Gray & Pigott, 2018; Nielsen & Hansen, 2007).



Figure 18. Sarat's photo of a park at a local lake

“I hope these Pictures Help Influence People to Go Out and Enjoy the View”: Inspiring Others to Enjoy Nature

With the hope to foster social change and community engagement (Amos et al., 2012) as a goal of Photovoice studies, both teachers included in the study plan publicly displaying the students' photos and captions for future students and community members. The O in the PHOTO acronym asked students to respond to the prompt; *how can this picture provide opportunities for others to improve their physical activity in nature?* Sebastian, in his response to PHOTO, reflected on the impact of nature on both himself (“I liked the way the grass looked in contrast to the sky”) as well as the potential impact his photo could have on others as he hopes it “opens people's mind to the beauty of nature” (Figure 19).



Figure 19. Sebastian's photo of a trail around a local lake

Similar to what was discussed in a previous theme, some students also felt that the accessibility of NBPA displayed in their photos could inspire others to participate. Aubrey wrote in her caption to Figure 20 that her photo shows “that there are so many ways to be active in nature...that you can learn new things while also being active.” Often, it can be as easy as “getting an app and going outside on an adventure” like in geocaching, one NBPA lesson that Emma offered as part of her *NBPA in Pictures* unit.



Figure 20. Aubrey’s photo of “some of the things we had to find during our time orienteering around the school”

Outdoor learning in general in educational settings can benefit the community because it facilitates children and youth’s lifelong environmental stewardship (Silverman & Corneau, 2017). Elsa wrote of the imagery in her photo and its ability to convey powerful ideas to others:

I feel like this photo demonstrates the importance of nature in our world and how many people rely on it as a “safe space” to clear their thoughts. During this photo,

I felt happy admiring the view of the land splitting with the clear blue sky (Figure 21).



Figure 21. Elsa's "photo taken from the peak of [a local mountain]... I felt as though it really captured the true beauty of nature"

This study suggests that Photovoice leads to critical thinking and discussion that allows self-reflection, understanding of others, and social support. This Photovoice project is consistent with that of prior Photovoice studies with adolescents in that it proved to be a rich research tool. The project allowed adolescents to open up about their experiences with NBPA. The components of this Photovoice process that resonated well with and therefore engaged the adolescent participants were: (a) the research questions were relevant to them; (b) they could visually capture their reality; (c) it provided a safe place to share their experiences with other peers and (d) they had the opportunity to present their photographs and captions directly to their teacher which in turn provided valuable information about their students' learning and daily lives. Providing opportunities to hear from the adolescents' point of view may begin to allow PHE teachers to learn and incorporate the types of NBPAs that interest and engage their students.

IMPLICATIONS AND CONCLUSIONS

This study describes a promising instructional approach for eliciting student voice and connecting students to place, themselves, others, as well as their community. The findings indicate that if provided the space and the voice, adolescents are willing and able to share important insights about how they want to be active outdoors. Their expertise can inform teachers about how to plan their PHE classes to incorporate students' preferred ways to be active outdoors and local areas for place-based learning. Photovoice methodology not only requires gathering images through photography to look critically at a specific aspect of an individual's life, but also calls for the individual to use the photographs to advocate for change in a school or community. Therefore, a future recommendation is to facilitate students in creating a needs assessment including a list of the shortcomings in the school and community, as they relate to being active in nature, and possible solutions. Another

recommendation is to facilitate a photo exhibit as it is the purest form of advocacy in traditional Photovoice projects (Wang, 1999). Teachers could place their students' photos on display around the school, or on social media as many teachers are now utilizing social media as an effective teaching tool. Wang (1999) indicated that Photovoice, while traditionally viewed as a research methodology, is really a tool that can enable those who typically are not given a voice — the marginalized and the ordinary citizens of society — to become powerful advocates for change. Photovoice presents a powerful opportunity to be used as an educational strategy with adolescents that demands further research.

In regards to the importance of providing youth with outdoor learning experiences, Gray (2019) stated, “clearly our educational challenge is how to create these wide-ranging [outdoor learning] opportunities and how to value these outdoor activities as legitimate experiences for students to learn that are equally worthy of a school and its teachers' investment” (p. 69). Throughout this study, participants were provided with an opportunity to explore the natural world through their own lens and draw connections between that natural world and various dimensions of health and wellness. Overall, the photos collected were representative of a student body eager to explore their surroundings and realize the many benefits of NBPA. Photovoice proved an effective method for helping students in PHE make a connection between NBPA in PHE and being active in nature outside of school, and through continued application, may ultimately, encourage a lifelong love of nature and physical activity. ■

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