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Transformative Potential of Friluftsliv in Physical Education: Insights From an International Student Programme

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Abstract

Friluftsliv is a Scandinavian concept that emphasises a deep connection with nature through outdoor activities. This study examines its transformative role in fostering physical literacy and environmental ethics among international students. The University of South-East Norway offers a year-long programme that integrates theoretical coursework with outdoor experiential learning, including multi-day expeditions, exemplifying embodied pedagogy. Students were observed for one week, and at its conclusion participated in creative focus groups where they discussed and illustrated their most memorable experiences. The winter expedition emerged as a clear highlight. Analysis of interviews and artwork revealed that the teaching methods used enhanced students' skills, knowledge, social connections, and motivation to engage with nature, thus reinforcing the four pillars of physical literacy. It also fostered a significant emotional transformation. While students initially approached nature from an anthropocentric perspective, the challenges of the winter trip, in particular, helped most of them to shift their outlook towards a more ecocentric view by deepening their connection with the natural environment. This study highlights the powerful role that experiential outdoor education can play in cultivating both physical literacy and environmental stewardship.

Keywords: Ecocentrism; education for sustainability; embodied pedagogy; Friluftsliv; outdoor education; physical literacy

Introduction

Despite its deep-rooted tradition in Scandinavian culture, Friluftsliv — a practice that promotes immersive outdoor experiences — remains underexamined in its role in shaping physical literacy and fostering ecocentric worldviews in higher education. While sustainability education has gained global attention, much of its implementation remains classroom-based and anthropocentric, often overlooking embodied and nature-based learning experiences.

Sustainability education is increasingly recognised as a crucial element in fostering a sustainable future. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), in its 2015 report, integrating sustainability across all educational areas is vital for equipping future generations with critical thinking, values, and knowledge, necessary to tackle the world's sustainability challenges (UNESCO, 2015). By blending environmental, economic, and social dimensions of sustainability across various school subjects, students can develop a comprehensive understanding and proactive stance on both global and local

sustainability issues. This broad educational strategy not only aligns with UNESCO's global sustainability goals but also empowers students to make positive contributions to the planet's future, fostering a more equitable, sustainable, and resilient world.

Consequently, UNESCO (2015) posits that all subjects, including physical education (PE), should contribute to education for sustainability. Quality PE is integral to children's holistic development, emphasising the simultaneous development of physical literacy, inclusive practices, and safety. This approach ensures that PE not only enhances students' physical skills and health but also promotes social inclusion and provides a safe environment for all learners. By fostering physical literacy, children gain confidence and competence in a range of physical activities that contribute to their long-term wellness. Inclusive practices ensure that every child, regardless of their ability, is given equal opportunities to participate and thrive. Additionally, prioritising safety within PE programmes protects children from potential injuries and creates a supportive space, conducive to learning and growth. However, quality PE, in general, and physical literacy discourse, in particular, neither draw on nature-based perspectives nor on education for an environmentally sustainable future (Lyngstad & Sæther 2021).

UNESCO's Education for Sustainable Development (ESD) promotes an approach based on Sustainable Development Goals (SDGs). However, this approach has been criticised for its predominantly anthropocentric perspective, which prioritises human interests over an ecocentric view that intrinsically values ecosystems and non-human entities (Kopnina, 2012). As outlined by Kopnina (2014), the shift from traditional environmental education — which embraced ecocentric ethics — to ESD has led to a paradigm where human welfare dominates, marginalising fundamental ecological principles that acknowledge the intrinsic worth of nature.

This anthropocentric bias in education is notably problematic as it fosters an educational narrative where nature is viewed mainly as a resource for human consumption, neglecting its intrinsic value and restricting the development of a connection with nature during formative years. This, in turn, complicates the cultivation of pro-environmental behaviours. In the context of physical education, Schnitzler and Saint-Martin (2021) highlight that this orientation has led to outdoor activities being conducted in increasingly artificial settings, diminishing genuine environmental engagement and impeding the fostering of essential ecological values. Such an approach risks “de-naturing” outdoor educational activities by favouring controlled environments over authentic interactions with natural settings, potentially hindering the development of a deeper, ecocentric understanding crucial for nurturing true environmental stewardship and fostering sustainable behaviours (Liu *et al.*, 2007). Furthermore, the lack of direct contact with nature in educational settings prevents students from experiencing and developing eco-citizenship, ultimately undermining the goal of sustainable living (Schnitzler & Saint-Martin, 2021).

Freirean ecopedagogy, by contrast, advocates for an ecocentric educational framework that emphasises ecological justice and interconnectedness (Misiaszek, 2019). In outdoor education, this translates to fostering genuine, immersive engagement with natural environments to cultivate a profound and intrinsic respect for the natural world. Grounded in the principles of experiential and place-based learning, this approach underscores the deep interconnection between humans and nature. Rather than reinforcing the perception of nature as merely a resource for human use, it aims to promote eco-citizenship by appreciating ecosystems for their intrinsic value. The Scandinavian tradition of *Friluftsliv*, which translates to “free air life,” claims embodying regular and meaningful engagement with nature, especially in Norway and Sweden. *Friluftsliv* was initially developed as a form of bourgeois male-dominated education (Gurholt, 2008), but it quickly evolved and diffused into school settings. Recently, Sjödin *et al.* (2023) have identified five different meanings of *Friluftsliv* within the PE context: (i) *Friluftsliv* as organisation, (ii) *Friluftsliv* as embodied hardship, (iii) *Friluftsliv* as skills, (iv) *Friluftsliv* as recreation, and (v) *Friluftsliv* as personal development. However, in all these cases, *Friluftsliv* implies frequent and prolonged

contact with nature. It might therefore be a driver to promote ecocentrism through a holistic experience that aims for a deep connection with nature (Breivik, 2013).

The definition of Friluftsliv also comprises more than physical activity. It also refers to being inspired by and experiencing nature and to changing one's environment (Lyngstad & Sæther, 2021). According to Naess (1995), since Friluftsliv takes place in natural settings, it requires a broader range of cognitive and emotional capacities, compared to other sports. Participants must be able to plan routes, handle surprises, confront dangers, change strategies, assist others, and observe weather changes. Friluftsliv is therefore a multidimensional concept that integrates diversity and complexity, engaging the whole person, both body and mind. To its advocates, this practice not only promotes physical and mental well-being but also fosters a deep, respectful relationship with nature and supports the democratic ethos of access to natural spaces, evident in the Nordic countries' education systems, public policies, and land-use practices (Gelter, 2000; Henderson & Vikander, 2007). Naess (2015) further proposes that the immersive experience offered by Friluftsliv could educate people about deep ecology, to seek a comprehensive transformation of our ways of living with nature. Therefore, Friluftsliv posits that the body is not merely linked to subjective experiences but is the foundation of such experiences (Standal, 2020). This approach is characteristic of embodied pedagogy, which is defined as "a pedagogy that unites the body and mind in a physical and mental act of knowledge construction" (Nguyen & Larson, 2015, p. 322). As an educational framework that prioritises movement as a means of learning, embodied pedagogy closely aligns with the concept of physical literacy.

Physical literacy, as defined by the [International Physical Literacy Association](#), encompasses the motivation, confidence, physical competence, knowledge, and understanding necessary to engage in physical activity throughout life. However, beyond these components, physical literacy is best understood as an embodied mode of interaction with the world, shaped by intentional movements and experienced through diverse physical activities (Durden-Myers et al., 2022). As a dynamic and evolving process, physical literacy extends beyond mere physical competence to include cognitive, affective, and social dimensions. This makes it an ideal theoretical framework for embodied pedagogy, which emphasises lived experiences, bodily awareness, and holistic development. An embodied pedagogical approach fosters physical literacy by recognising the body's central role in learning, encouraging movement exploration, and integrating personal reflection. It also acknowledges the interplay between individuals and their environments, creating opportunities for meaningful movement experiences. Through this lens, physical literacy is cultivated not only by acquiring skills, but also by developing a deeper awareness of movement, fostering autonomy, and critical reflections on cultural of physical activity.

Friluftsliv, with its emphasis on immersive outdoor experiences, provides an ideal context for developing physical literacy through embodied engagement with the environment. By fostering movement exploration in diverse landscapes, it encourages individuals to develop physical competence, while deepening their connection with nature. Through exercise and regular encounters with nature, Friluftsliv could, therefore, develop ecocentric attitudes, as well as young children's physical literacy. Although such programmes remain scarce, Beery (2013) demonstrates a significant and meaningful relationship between Friluftsliv, operationally defined as nature-based outdoor recreation participation, and connectedness to nature. In contemporary practice, Friluftsliv is an intrinsic part of PE in Norway and should represent about a third of PE programmes in secondary schools (Utdanningsdirektoratet, 2019). At universities, many PE programmes include Friluftsliv as a core subject and is offered as part of the annual curriculum for international PE students at both, bachelor's and master's levels. However, the impact of such Friluftsliv programmes on physical literacy and environmental ethics has not yet been thoroughly assessed.

Consequently, in this article, we sought to investigate the extent to which a Friluftsliv programme might exemplify a successful way of implementing education for sustainability, within the context and objectives of PE. More precisely, we sought to examine whether such programmes might simultaneously develop not only ecocentric ethics and attitudes but also physical literacy, in an inclusive and safe context.

Methods

Participants

Twenty participants were enrolled in the Friluftsliv programme offered by the University of South Norway, all of whom were approximately 20-year-olds. These individuals represented eight different nationalities (i.e., French, German, Austrian, Taiwanese, Czech, Estonian, Belgian, and Spanish) and were all third-year PE students in their respective countries. This diverse group participated in the EuROpean Action Scheme for the Mobility of University Students programme during the 2023/2024 academic year. All the students in the cohort consented to participate in this study.

Programme description

The programme consisted of a one-year outdoor education curriculum at the bachelor's degree level, which included both theoretical and practical courses focused on Friluftsliv (Table 1). Throughout the year, students engaged in three experiential trips during three seasonal periods: autumn, winter, and spring. These trips ranged in duration from one to three days each and were student-prepared, under the guidance of their instructors.

Instructor profile

A team of five Norwegian educators, specialising in Friluftsliv didactics, instructed the students throughout the year. These educators brought a deep understanding of both the theoretical and practical aspects of outdoor education through more of 10 years in practicing an teaching Friluftsliv.

Table 1. Overview and description of the courses

Programme duration	Weekly courses	Norwegian sports	Trips
Full-year (September to May) or half year (Semester 1 or 2)	Friluftsliv theory, Physical Education History Sociology Sport Practices	Friluftsliv Bandy Innerbande Dance Cross-country Skiing Biathlon	Fall Trip (orienteering) Winter Trip (cross country skiing) Spring Trip (Kayak). Preparation included in the programme.

Data collection methods

Data were collected at two separate phases: one in immersion during the programme through an ethnographic participation, and the other at the end of the programme through a creative focus group discussion.

Phase 1. In April 2024, one of the co-authors, a French university academic, conducted an in-depth ethnographic study over a one-week immersion period during Friluftsliv-led outdoor PE sessions within the university campus. Through active participation in activities such as group

discussions, nature-based exploration, and reflective exercises, she was able to gain a first-hand experience of the educational process and its relationship to the natural environment.

During the week-long process, the researcher compiled comprehensive ethnographic field notes, by documenting both observable interactions between participants and sensory and embodied experiences central to the outdoor learning process. In doing so, she adopted a phenomenologically inspired perspective, focusing on how individuals perceive, feel, and make sense of their bodily engagement with nature. This process aligned with Wacquant's "sociology from the body" (2015), as well as an enactive ethnographic approach (Azema et al., 2020), in which the researcher sought to capture the lived experiences of movement, perception, and environment in educational contexts.

Both the researcher's and students' sensory and embodied experiences were recorded, not merely as observational data but as an attempt to understand how cognition and learning emerge through action and environmental engagement. By incorporating reflexive conversations with participants, the study also explored how individuals verbally expressed their embodied experience, thereby, bridging ethnographic observation with a phenomenological description.

The ethnographic and phenomenological data were then analysed to generate recurring themes and insights regarding the relational dynamics between participants and instructors, the pedagogical methods employed in outdoor education, and the role of the natural environment in shaping both cognitive and embodied learning experiences.

Phase 2. We used Creative Focus Groups, a method grounded in creative research methods (Kara, 2015, 2020; Rangarajan et al., 2024), while also emphasising sensory and embodied experiences (Pink, 2015). The creative tools, adopted within our focus group discussion, combined several approaches identified by Kara (2020). First, as an art-based approach (Leavy, 2014, 2017), we incorporated drawings as a tool of expression. The objective was to use the drawings as artefacts for elicitation purposes by engaging in experience-sharing and dialogue (Dewey, 2005). Secondly, we incorporated an embodied research approach, which placed the body at the centre of communication and meaning-making.

Rather than prioritising one form of expression over another, we encouraged participants to express their experiences holistically, through their bodies. The theoretical foundation of this process drew on Brown's (2019) recognition of the limitations of language and the power of metaphors (Lakoff & Johnson, 2003), highlighting the embodied nature of communication. Thirdly, we used a multimodal approach by integrating graphical elicitation methods and visual outputs, such as drawings created by the participants (Hicks & Lloyd, 2018). This multimodal process was based on Ferrari's (2024) work on drawings.

The arts, therefore, became an intentional and essential form of expression (Dewey, 2005), enabling participants to communicate experiences that may have been challenging to articulate verbally. Artefacts, such as drawings, were not primarily treated as data but rather as tools to elicit experiences and facilitate discussion. This approach underscored the absence of a systematic analytical framework for drawings in the same way as traditional verbal data. Instead, these creations served as an alternative language (Dewey, 2005), uniquely individualised and contextually grounded, offering new perspectives on participants' experiences.

This creative method fostered dynamic engagement, where each interaction helped reconstruct unique creative contexts through relational exchanges on diverse experiences. Empathetic perspective-taking, as highlighted by Henriksen et al. (2017), also played a key role in enhancing both individual and collaborative creativity. This process helped us stimulate innovative thinking and enabled the co-construction of outcomes, which were previously beyond our imagination, and a broadening of the boundaries of creative potential. By focusing on relational and experiential exchanges, this method highlighted the transformative impact of creativity in reconstructing perspectives and generating novel insights.

During this phase, the participants were asked to consider their feelings and collect their representations following a Friluftsliv experience by identifying three words that represented their

experience. We then asked the participants to elaborate on one of the words. Then, the participants were asked to individually create visual representations of a significant experience in nature through drawings, collages, and the use of keywords. These visual creations were specifically designed to serve as stimuli for subsequent discussions, engaging participants: first, in a creative exploration of their experiences and then, encouraging them to articulate their thoughts and feelings verbally based on their drawings. Finally, the participants engaged in group discussion by focusing on themes, such as emotional responses, connections with nature, memorable experiences in Friluftsliv, constructed knowledge, and future teaching applications. In all, five groups of five participants each were formed to work on three collaborative projects, integrating their individual experiences into collective representations.

Data analysis

The analysis of the drawings and the creative focus group data were carried out by two researchers to ensure intercoder reliability. The data analysis process involved three steps. First, the researcher who collected the ethnographic data analysed her notes through a phenomenological lens, using indicators related to sensations, the body, interpersonal relationships, and the connection to nature. Second, the focus group discussions were translated, transcribed, and coded using Braun and Clarke (2019) thematic analysis framework. Finally, the analysis of the drawings was conducted in three further steps:

1. A descriptive analysis: The drawings were described factually based on specific indicators, like form, orientation, body representation, environment, and equipment.
2. A comparison with student verbatims: The descriptions were then cross-referenced with the participants' verbal explanations of their drawings.
3. A categorisation of embodied experiences: We then categorised the participants' bodily experiences using indicators, such as resistance, ambivalence, or resonance with nature.

This multi-level approach combined phenomenological, thematic, and visual analyses, offering a comprehensive understanding of the participants' experiences.

Results

Phase 1: Ethnographic description

On the way to the bouldering site, each participant was asked to choose a stone. The group gathered on the climbing mats, around a tree, above the main boulder (see Figure 1). Spring was beginning in Norway, and the birds were starting to sing. The educator invited everyone to listen, observe, and reflect on their personal relationship with the environment. Then, the educator invited each participant to pick up their stone, touch it, and explore it with their different senses (see Figure 2). They were asked about the origin of the stone, their relationship with it, and their connection to it: "we run on it," "it can be a shelter," "it's not alive." The educator further probed: "How do we know it's not alive?" "What's the relationship between the stone and the trees?" "Where do stones come from? Do they move?" The group continued its sensory exploration: "What makes your stone special?" On this day, some stones sparkled in the sun, and the participants noticed the presence of quartz crystals. This prompted the educator to continue questioning: "What is it? Part of the stone? Or the relationship between the sun and the stone?" The educator then encouraged the participants to wet the stones and continue their sensory exploration. Following this, everybody closed their eyes, named their stone, and exchanged it with the person next to them, allowing the group to explore all the stones. After some discussion, the group headed to the base of the boulder to continue the bouldering session. The first exercise



Figure 1. Participants gathered around a tree for sensory exploration of the stones.

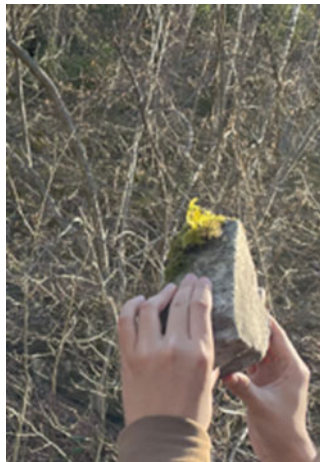


Figure 2. Stone as a support for relational and sensitive exploration.

involved climbing the slab using the edges of their shoes to feel the grip: “feel balance, feel friction, try, experience” (see Figures 3 and 4).

This session continued and concluded with a debriefing with the participants, in which they talked about what they had learned by feeling the rock, by sensing places that were better than others for standing. The educator also emphasised the importance of observing others to find solutions for climbing that may not have been necessarily shared. Indeed, these techniques may not have made sense to a partner because they depended on the relationship established between their body, physical abilities, and their perceptions of the environment (e.g., the rock). The following day, the participants revisited this bouldering lesson to work on phenomenology concepts, with excerpts from Ingold (2000) and Merleau-Ponty (1962). The educator reminded the participants that their sensory experiences in contact with the rock had given rise to a meaningful world, dissipating the dualistic approach of the world and the self: “The boundary, this great separation that would place humans on one side and nature on the other, dissipates for a moment to give way to union, in an ecology of the real” (Ingold, 2013, p. 256).



Figure 3. Experimenting what adheres and what does not adhere.



Figure 4. Feel the rock session.

Finally, the participants, who had initially a predominantly scientific and detached understanding of the rock, explored the embodied and phenomenological approach, not as latent and undervalued: “we don’t value our own perception of the stone,” in the words of the educator. This perception was generated and shared during this activity of sensory exploration of the stones: “we do not experience the molecules, we experience the weight of the stone, for example” (Educator). Initially, their perceptions of themselves and of the objects in the environment was not relational but isolated and analytical. This sensory exploration of the stones, combined with reflexivity on each person’s bodily techniques, appeared to initiate a destabilisation of a naturalist ontology — or a dualistic view of people and nature characterised by a detached, overhanging perspective that distances nature (Descola, 2005) — leading toward an ecocentric understanding of the world. Through the action of gravity on our bodies, through the functioning of our senses, and the tactile properties of the skin, a sensory world emerges (Merleau-Ponty, 1962).

Table 2. Verbatim responses of participants regarding the keywords describing Friluftsliv

Keyword	Occurrences	Verbatim
Freedom	4	“It’s freedom because you can go wherever you want. Off the beaten path. It’s perfect. But it’s also a big step outside my comfort zone” (Jessica). “It’s being outdoors in open spaces [...] outside society [...] without the noise of other things, people, or the crowd [...] seeing some animals” (Clara)
Nature	3	“You appreciate nature, but you also use nature, to somehow live in it. For example, when you go hiking, you use wood to make fire” (Maya, nature and paradox). “FLL is about being a part of nature and having experiences in nature” (Luc)
Peace – Calm	3	“Peace, because when you’re in nature, you have nothing to fear. You have your things like making a fire, but you don’t have to think about other things, it’s very calm” (Cesario). “When I’m in nature, FLL, or with people, I don’t think about the stress I might have in everyday life. I’m very focused on the moment, just enjoying, being peaceful” (Stefan)
Enjoy	2	“Enjoying the moment, like every moment we spend in the morning when we go hiking. Every moment is special, just enjoying and having a good time” (Tim)
Experience – Activity – Learning by doing	2	“It’s learning by doing [...] doing what you want and learning to do it through your experiences” (Alberto)

Phase 2: Creative focus groups

Participants shared keywords that Friluftsliv evoked for them at the end of their Erasmus training. Altogether, they identified 21 keywords. The words nature (16), freedom (14), and joy (6) were the most frequently cited. Other associated words included peace and calm (3), experience (3), life (3), outdoor life (2), as well as observation, paradox, breathing, introspection, autonomy, feeling, and wilderness.

When asked to rank the words, participants prioritised freedom (4), nature (3), calm (3), and joy.

The participants were then asked to provide more detailed explanations about the meanings of the keywords. Table 2 provides some verbatim examples related to these keywords.

This descriptive process helped determine the extent to which participants described a more ecocentric or anthropocentric view of their relationship with the environment. We identified a majority of the keywords related to an ecocentric view (15 words), whereas only one described an anthropocentric view. Four keywords could not be specifically categorised as either ecocentric or anthropocentric. The linguistic registers used to characterise Friluftsliv reflected an ecocentric approach to the environment, sometimes highlighting the necessity to build technical skills for living in nature and/or using nature.

During the discussion, participants were also asked to choose and describe a key moment from their entire Erasmus Friluftsliv year. All participants unanimously and independently chose the trips experienced during the year as key moments, with the vast majority highlighting the winter trip as a standout.

We grouped these significant moments into different categories or dimensions, depending on what was meaningful to the students in their lived and recounted experiences. The focus is therefore phenomenological:

- Contemplation: a sunset, a mountain, the absence of human traces on the ground, calm
- Relationship with time: living in the present moment, appreciating simple moments, stepping away from daily life and schedules
- Relationship with others, solidarity, and sharing: supporting a fellow student, fishing or walking together, contemplating nature together

- Acquired knowledge: learning skills such as fishing, skiing, chopping wood; discovering nature; going off the beaten path; learning autonomy; learning how to organise; self-awareness
- Sensory and emotional experiences: physical sensations like hardship, challenge, fatigue, anger, frustration, but also pleasure, satisfaction, pride, joy, and peace.

An analysis of four specific experiences

For Michael, the mountain trip left a profound impact. Starting from the base camp, participants had the option to climb to the top. The ascent was exhausting, but Michael emphasised the breathtaking view of snow-capped peaks, the calm in his body, and the pride in his effort. He appreciated staying long enough to fully absorb the experience.

Olivia recalled that moment with Elian. She remembered the heaviness of her backpack during the climb but also the incredible weather they enjoyed when they stopped: *“It was magnificent, and I was so excited.”* They shared a similar journey, facing the weight of their backpacks and learning to ski. When they paused to rest, Olivia recalled, *“It was magnificent.”* Luc, however, described a frustrating experience during his first night at -17°C : *“I felt like a tourist . . . it was more of a burden than the pleasure of being outside.”* This contrasted sharply with his understanding of Friluftsliv, which he described as *“being part of nature,”* a connection he hadn’t felt on that trip. However, he also shared a more introspective moment: *“For me, sometimes I just wanted to spend an hour alone, and then I went into nature and felt more connected . . . It was really nice because you feel so small in such a vast ecosystem.”* He highlighted the group dynamic as well: *“We can choose. There is no scenario to follow, no class to attend. If we want to be alone, we can be alone. If we want to share with one or two people, we can do that. And if we want to share something with the big group, there’s space for that too. It’s really pleasant because we can organize ourselves based on our needs and desires.”*

Tim, a participant from France expressed that his first trip to Norway stood out: *“Everything was new . . . the nature was incredible.”* While fishing with a friend, Tom felt a rush of emotions. When he caught a fish, he hesitated to kill it, realising he wasn’t ready. *“It was so intense . . . everything came together at once.”*

Broadly, these examples reveal the engagement, even the excitement, of the participants regarding the nature trips. The sensory stimulation associated with external conditions, like changing weather, from snow to sunshine or very cold temperatures at night and milder ones, thanks to the fire, or physical activity in the form of heavy backpacks, difficult ski techniques, and intense physical effort, gave way, over the course of the trip, a sudden calm that seemed conducive to fostering an attitude of openness (awareness) and a connection to the world. The group provided support when the experience became difficult. For example, for Annie, whose friend was sick: *“Everyone was helpful; you have a lot of people around you, and they care about you.”* But it also became a space for sharing intense emotions and building collective memories. Most participants pointed out that the moment of contemplation was collective, however, without elaborating further, highlighting a co-presence and a shared social experience. Further, a new relationship with time was experienced. The organisational as well as technical skills were developed as sources of pride and sense of competence, allowing for greater openness step-by-step.

Phase 3: Drawings depicting relationship with the environment

The graphic and sensory elicitation during the creative focus groups was fruitful. The participants engaged in creating individual drawings and provided in-depth, sensitive discussions of their experiences of Friluftsliv. Two drawings, representing ecocentred and anthropocentric perspectives, are highlighted below. These drawings and their verbal narratives illustrate the participants’ bodily encounters with nature, with particular ecocentric and anthropocentric leanings. Our focus lies in how sensory, affective, and relational processes unfolded in their visual and verbal forms.



Figure 5. Elian's drawing.

Elian's drawing (Figure 5) depicts a figure standing on ski boards, facing a landscape with trees, a mountain, and a sunset. Her focus is on nature, with her body outlined in green, reflecting her connection to the environment. Elian described her drawing as: "I drew myself at the top of the mountain . . . I felt like I was using my whole body to climb, not just my legs but also my arms with the poles." She captured both the physical and emotional sensations of the moment, emphasising her heightened heart rate and the physical effort involved.

While her experience was personal, Elian's narrative also highlights the importance of group support: "I didn't have to do it alone, we were together at the top." Nature played a crucial role in enhancing her experience, providing a sense of calm and joy. She explained: "I drew a yellow part on my chest and heart because it felt like I could feel the sun on my chest and heart."

Objects like the ski boards, poles, and food were reported as being vital for her physical comfort and energy, as Elian recalled needing a biscuit to refuel her energy during the climb. The verbalisation of the drawing reflects the sensory dynamics of Elian's experience, balancing the physical effort with admiration for the natural beauty around her: "I was just standing there, not moving, enjoying the moment and watching the sunset . . . everything was peaceful."

Elian's experience represents a deep, holistic connection with nature, where time seemed to stand still. She felt empowered by her physical abilities and reported being fully immersed in the moment, demonstrating an ecocentric approach to her relationship with the natural world. Her narrative also embodies a dynamic interplay between movement and contemplation, and effort and reward (Pink, 2015).

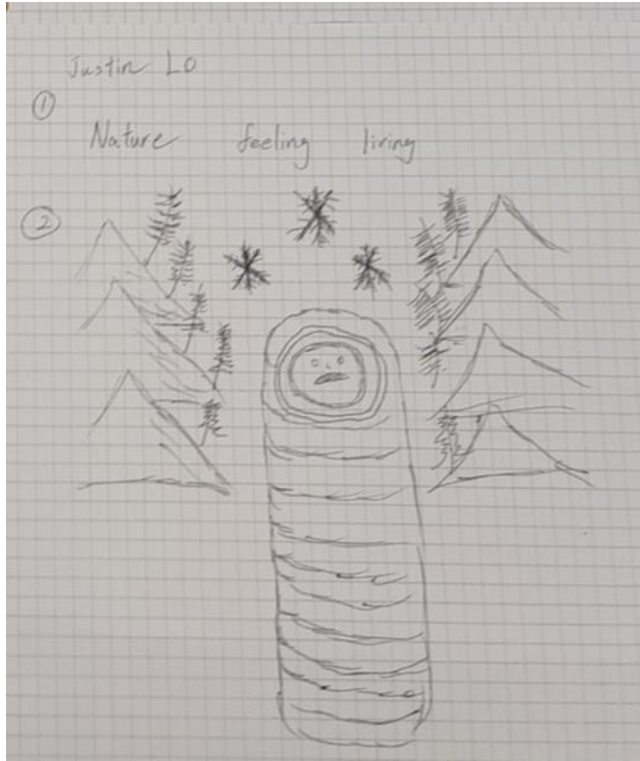


Figure 6. John's drawing.

John, who was from Taiwan, offered a contrasting, anthropocentric experience marked by isolation and struggle (Figure 6). His drawing shows a man with a moustache, wrapped in a large sleeping bag, standing between mountains beneath snowflakes. He explained, "I felt like I was always in the snow for two days. And it was quite . . . stressful. Horrible." John's experience was intense and introspective, shaped by harsh natural conditions.

The cold and snow, combined with inadequate equipment like clothes and sleeping bags, made him feel vulnerable and isolated. He expressed his internal struggle: "I thought I would die here," revealing his confrontation with his physical and mental limits: "You go to war against yourself." This kind of nature, for John, was hostile and overwhelming. The cold and snow dominated his experience, turning it into a physical and psychological battle: "I'm trapped . . . in the forest, in the mountain." The objects meant to protect him, like sleeping bags, proved insufficient: "I had two sleeping bags and still felt cold." This highlights his dependence on equipment and the frustration of its failure to provide comfort. His relationship with nature was defined by constant confrontation and survival, with the cold amplifying feelings of stress and vulnerability.

Unlike Elian, John's experience was rather solitary, with no interaction or support from others, emphasising the theme of personal challenge. Yet, his experience was also transformative. Despite the isolation, he felt a sense of achievement through his perseverance: "You go to war against yourself, to surpass yourself." His narrative reflects an anthropocentric perspective, where Nordic nature served as an adversary to overcome. Yet, through this confrontation, John also experienced personal growth (Wacquant, 2015).

We interpret that, in this context, nature served as a means for John to assert and fulfil his human nature through confrontation and challenge. While this perspective is part of a broader continuum, we believe it leans toward a more anthropocentric stance, though we acknowledge

that individual experiences can reflect elements of both ecocentrism and anthropocentrism depending on the situation.

Friluftsliv: A pedagogy that also develops physical literacy

Through practices rooted in Friluftsliv, the phenomenal perceptive and sensitive body, in direct and immediate contact with a sometimes unpredictable environment, is valued. By engaging participants in sensory, motor, and reflective activities, the study aligns with the core philosophical pillars of physical literacy: holistic, existential, and phenomenological. The holistic pillar is reflected in the integration of physical, cognitive, psychological, and social dimensions, as participants developed motor skills through climbing and skiing while also engaging with nature, such as exploring the texture of stones through sensory reflection. The existential pillar is visible in the participants' interactions with their environment, where navigating varied terrains challenges them to adapt and foster, both confidence and resilience. Finally, through practices rooted in Friluftsliv, the perceptive and sensitive body was valued for its direct and immediate engagement with an often unpredictable natural world.

Thus, this study's results show development across all four dimensions of physical literacy: physical competence through motor activities, psychological growth via emotional resilience, social cohesion through group activities, and cognitive reflection through environmental and body exploration.

Discussion

The main findings of this study illustrate the Friluftsliv programme's effectiveness as a pathway for promoting both environmental and physical literacy, within the context of PE. Participants consistently reported that the programme was intense and had a significant impact on them. This impact varied among participants. However, while a few participants felt the harsh conditions spoiled their encounter with nature, most demonstrated a deeper engagement with the natural world and a shift toward a more ecocentric ethic, explicitly recognising nature's intrinsic value.

From the participants' perspectives, the programme successfully facilitated a multicultural learning environment, where students from diverse international backgrounds possibly embraced a new perspective on nature and sustainability through active lifestyles. The combination of physical and mental preparation, context-specific knowledge, and group dynamics fostered personal connections with nature and helped participants overcome environmental challenges, particularly in harsh conditions like cold temperatures.

In the context of the study, Friluftsliv exemplifies an embodied pedagogy that integrates education for sustainability within PE. The programme blends physical activities such as hiking and outdoor sports with deeper philosophical engagement, helping students experience nature not just as recreation but as an immersive, meaningful encounter. It goes beyond the anthropocentric ESD framework, as it allowed some students to engage with the teaching of environmental ethics as proposed by Kopnina, (2012). This approach, by involving the whole person — physical, cognitive, and emotional — aligns with Menzies' (2005) concept of "ecological literacy," which advocates for active and embodied learning. Through such experiences, participants were able to develop a greater awareness of nature's intrinsic value, fostering an ecocentric worldview that emphasises sustainability and ecological stewardship.

Our findings indicate that Friluftsliv fosters Physical Literacy (PL) development by immersing participants in dynamic and unfamiliar environments, where movement enhances physical competence, confidence, and motivation. Although, PE provides a structured setting for PL acquisition, our results align with the perspective that PL extends beyond formal education, emerging through diverse lived experiences (Whitehead, 2019). The embodied nature of

Friluftsliv, particularly in challenging outdoor conditions, deepens movement awareness and reinforces PL as a flexible and adaptive capability that is not limited to school-based PE.

By integrating movement with sensory engagement in natural settings, Friluftsliv promotes physical, cognitive, and emotional development. This holistic approach, as described by Beery (2013), facilitates a deeper connection with nature than traditional educational models, encouraging students to plan, adapt, and collaborate. Through these experiences, the participants of this study developed not only technical skills and environmental awareness but also a heightened understanding of their own bodies and abilities in relation to their surroundings.

Transformative learning theory (Mezirow, 2000) provides a valuable framework to understand how Friluftsliv fosters both ecological and personal transformation. In this study, participants encountered disorienting dilemmas, particularly during the winter expedition, where they faced environmental challenges that forced them to reassess their assumptions about nature and their own resilience. Such experiences disrupted participants' pre-existing views, prompting many to develop a deeper ecological awareness.

This further aligns with the Inner Development Goals (IDGs) framework (Inner Development Goals, 2022), which highlights that inner transformation is essential for sustainable action. Participants' experiences resonated strongly with the Being and Relating dimensions of IDGs, particularly through heightened self-awareness, emotional resilience, and a deepened connection with nature. Similarly, collaborative experiences such as navigating harsh weather conditions, planning routes, and supporting one another reflect the Collaborating and Acting dimensions, reinforcing the idea that sustainability requires both personal and social growth.

However, this shift towards an ecocentric perspective is not always straightforward. As seen in John's experience, extreme environmental conditions, such as the cold, fatigue, and isolation, can reinforce an anthropocentric perspective, as the need to survive leads to a confrontation rather than a harmonious connection with nature. This highlights the importance of tailoring environmental challenges to the individual's capacity, ensuring that the experience fosters engagement rather than alienation. When appropriately structured, these challenges create opportunities for students to develop a more ecocentric relationship with nature, as observed in most other participants' reflections.

Beyond its role in ecological transformation, Friluftsliv also fosters PL by integrating movement, sensory engagement, and problem-solving in natural settings. Participants reported improvements in skills, motivation, and knowledge of nature, supported by group dynamics that enhanced social and emotional growth. This reinforces Friluftsliv's effectiveness in promoting both PL and sustainability education. The holistic approach proposed by Friluftsliv suggests that education for sustainability should extend beyond knowledge transmission to include experiential and embodied learning practices that cultivate the inner capacities necessary for meaningful ecological stewardship.

Limitations of the study

It would be naïve to assume that Friluftsliv automatically leads to the development of ecocentric attitudes. The modern version of Friluftsliv can shift the focus to sports and competition, thereby, inadvertently supporting an anthropocentric worldview, in stark contrast to its ecological aims (Lund, 2022). Such competitive orientations may undermine the intrinsic value of nature and hinder the development of a symbiotic relationship between humans and the natural world, treating nature merely as a backdrop for human achievements. Fortunately, this was not the case in the specific pedagogical programme discussed here, which aligned with the core principles of deep Friluftsliv as outlined by Breivik (2021). By participating in non-competitive Friluftsliv activities such as hiking, climbing, and skiing, which echoes the activities of ancient hunter-gatherers, participants developed a profound connection with the environment. This

non-competitive curriculum enhanced their respect for nature's complexity and diversity, contrasting with more traditional education models that emphasise theoretical knowledge over practical application.

A major limitation of this study is concerning the principle of inclusion. The Friluftsliv programme we described and analysed focused only on social inclusion, excluding students with disabilities from participation. Additionally, all participants volunteered to be a part of the programme, which raises questions about the applicability of the findings to individuals who do not necessarily volunteer. Given the transformative yet challenging nature of the experiences described, such as potential physical and psychological strain, implementing this programme more broadly could pose ethical concerns. Careful consideration of the characteristics of the population and a phased approach are therefore recommended when implementing the programme on a wider scale.

Another limitation concerns a paradox inherent to the programme's environmental impact, which was outlined by one participant. While it aimed to enhance eco-literacy and deepen participants' connection to nature, it required extensive travel. Participants had to fly from their home countries and frequently travel to various activity sites, increasing their carbon footprint compared to staying in their own countries. This travel not only contributed to greater carbon emissions but also potentially disturbed local wildlife and impacted the landscape. For instance, through woodcutting and camping preparation. Consequently, the net effect of the programme on sustainable behaviour remains an open question.

Directions for future research

Future research can be built on these findings by addressing the following key aspects:

1. **Multicultural Perspectives on Ecocentrism:** This study highlighted shifts from anthropocentrism to ecocentrism, but the role of cultural background in shaping these shifts remains underexplored. Future research could compare how students from different national and cultural backgrounds engage with Friluftsliv pedagogy and develop ecological worldviews.
2. **Long-Term Impact on Environmental Behaviour:** While students reported a greater connection to nature during the programme, it is unclear whether this transformation leads to sustained behavioural change. Longitudinal studies could track how participants incorporate Friluftsliv principles into their lifestyles over time.
3. **Integrating IDGs into Friluftsliv Education:** While our findings align with the IDGs, the Friluftsliv programme we analysed did not explicitly incorporate these dimensions. Future studies could explore how structured IDG-based interventions could enhance the sustainability impact of Friluftsliv programmes.

Conclusion

This study demonstrated that the Friluftsliv pedagogy provides a valuable model for integrating physical and environmental literacy through embodied learning. By engaging 20 multinational higher-education students in immersive outdoor experiences, this programme encouraged many participants to develop an ecocentric worldview, fostering a deeper connection with nature, while improving their PL. However, not all students experienced this shift equally. We found that for some students, the harsh environmental conditions also reinforced an anthropocentric perspective, highlighting the role of individual backgrounds and adaptations as shaping the impact of Friluftsliv.

Beyond fostering PL and ecological awareness, Friluftsliv also aligns with the IDGs, promoting self-awareness, relational growth, and resilience as essential components of sustainability education. This suggests that outdoor experiential learning should be seen not only as a way to develop technical and environmental skills but also as a means to cultivate inner capacities necessary for long-term ecological engagement.

While this study highlights the transformative potential of Friluftsliv, future research is needed to explore how different cultural perspectives, personal dispositions, and environmental factors influence its effectiveness. Additionally, sustainability education must continue to address the paradox of increasing eco-literacy while minimising the environmental costs of travel and outdoor learning experiences. Addressing these complexities will be key to ensuring that Friluftsliv serves as a truly sustainable model for education.

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