Presence and (dis)connectedness – the influence of smartphones usage on human–nature and human–human interactions in outdoor studies

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Interactions between students and nature and students and their peers are central to learning processes in outdoor studies programs. This paper draws on symbolic interactionist social theory to interpret participants' experiences of smartphone usage and its impact on human–nature and human–human interactions. The findings are derived from a collective case study using semi-structured interviews with educators and focus group interviews with students enrolled in outdoor studies programs in Norway. Two primary themes were identified through reflexive thematic analysis: perceptions of nature and attentiveness to peers. Each of these themes illustrates the fluctuating presence and (dis) connectedness of students and the implications of this for learning out-of-doors. On the one hand, the findings suggest that the use of smartphones reduces students' sensory perception of nature and their attentiveness to interactions with their peers. On the other hand, smartphones and their access to online networks can contribute to the continuity of learning experiences between indoor and outdoor learning, as well as beyond the formal learning environment. Taken together, this inquiry offers new insights into the challenges of tertiary level teaching and learning outdoors in spaces that are mediated (at times) by interactions with smartphones and associated media infrastructures.

KEYWORDS

outdoor education, smartphones, presence, symbolic interactionism, mobile technology

Introduction

The impacts of mobile technologies teaching and learning in pedagogical settings of all kinds is an ongoing topic of concern (Sharples et al., 2009; Sevillano-García and Vázquez-Cano, 2015; Flavin, 2017). The widespread availability of mobile devices has contributed to learning becoming more personalized, accessible, and flexible, and opened new avenues for collaboration and the dissemination of information (Campbell, 2018). However, there is also a wide range of challenges connected to the use of mobile technology in education. For instance, Sophonhiranrak and Sakonnakron (2017) point at issues of safety, availability and access to networked infrastructures, students' attitudes and their use of devices in ways that are not pedagogically relevant or appropriate. Yousafzai et al. (2016) underline issues related to the physical aspects of devices, such as battery life and heterogeneity in the software

(operating systems) of devices which may prevent some students from accessing and using certain features or applications. All of these factors affect the effectiveness of using mobile technologies in education. In addition, Kambourakis (2013) stresses that too little attention is paid to ethical issues related to the privacy of both students and educators. More broadly, Traxler (2009) argues that 'the mobile learning community is now faced with broader challenges of scale, durability, equity, embedding and blending, in addition to the earlier and more specific challenges of pedagogy and technology' (p. 506). In the field of outdoor education and outdoor studies, researchers have raised specific concerns about the potential negative impacts of the use of mobile technologies on outdoor learning. Some primary concerns include distracting students from the learning experience and natural environment (Smith et al., 2016; Hills and Thomas, 2020), disrupting social interactions among students, fueling a technology-driven false sense of safety (van Kraalingen et al., 2022; van Kraalingen, 2023), and possibly limiting the development of certain skills (Smith et al., 2016).

With the rise in the use of mobile devices as educational tools, research has increasingly focused on how such technologies can enhance learning (Meishar-Tal and Gross, 2014; Edmonds and Smith, 2017). Many of these studies, however, tend to address affordances (Lai et al., 2007; Hills and Thomas, 2020; Sebastián-López and de Miguel González, 2020) and issues of usability (Santos, 2015; Sevillano-García and Vázquez-Cano, 2015; Radianti et al., 2020), rather than the impacts of mobile technologies on student 'presence' and interactions between students, landscape, and their peers. Rodgers and Raider-Roth (2006) define presence as:

> A state of alert awareness, receptivity, and connectedness to the mental, emotional, and physical workings of both the individual and the group in the context of their learning environments, and the ability to respond with a considered and compassionate best next step. (p. 265)

Despite increases in the incorporation of mobile technologies in outdoor learning contexts, the influence of mobile technologies on students' perceived sense of presence and, subsequently, their interactions with the natural environment and their peers, has remained under-researched.

The aim of this inquiry is to interrogate what the literature suggests is a certain sector-wide ambivalence towards issues of presence and (dis)connectedness. During the course of this research, it became clear that smartphones were the predominant type of mobile technology employed in outdoor studies. Through critically challenging taken for granted interpretations of the influences of smartphones on interactions in the context of outdoor studies programs in Norwegian higher education, this paper aims to provide a deeper understanding of educator and learner experiences of how smartphones influence the interactions between students, and students and the more than human world.

Outdoor studies in Norway

Outdoor studies in Norway, also referred to as *friluftsliv* studies, consider close interactions between people and between people and landscape as a central part of the learning process (Bischoff, 2000; Tordsson and Vale, 2013). These interactions comprise two primary relations: first, grounded in Arne Næss' eco-philosophical heritage, are the interactions between students and the natural environment, which enable learning to take place. Outdoor learning is viewed as being situated in specific places and emphasizes that students are present, immersed, and active within their immediate learning environments (Løvoll, 2019). A wide variety of studies have claimed the benefits of outdoor and environmental education activities for enhancing nature connectedness (see for example, Ernst and Theimer, 2011; Barrable and Booth, 2020).

The second relationship involves interactions between student and their peers. Outdoor education pedagogy often draws on social constructivist philosophies of learning (Løvoll, 2019), where experiences and interactions with peers are emphasized as central to development and learning (Vygotsky et al., 1978). The learning process is thus understood to be supported through interactions between students, where which they co-construct knowledge and meaning in what Lave and Wenger (1991) refer to as 'communities of practice'. Broadly speaking, interactions between students and between students and the natural world are central elements of tertiary outdoor studies programs in Norway.

In the present day, however, the existence and use of modern technologies, and mobile devices in particular, challenges, disrupts and thus transforms what used to be direct contact between people and between people and the more than human. Consequently, concerns have been raised about how mobile technologies influence social interactions and the ways in which such technologies might place a barrier between student and the natural world (Louv, 2005; Midgley, 2014; Greenwood et al., 2015). In particular, outdoor educators are concerned with a perceived disconnection between humans and nature (Beery, 2014; Beames, 2017). While acknowledging the undeniable presence and embeddedness of mobile technologies (Jandrić et al., 2018; Knox, 2019) and the always available communications environment (Boyd, 2014; Reed, 2022), we argue that it is important for the field of outdoor education to gain a deeper understanding of how interactions in the outdoor classroom are affected by and mediated through smartphones.

Presence and learning

The concept of presence is used broadly and comes with a considerable literature. Some approaches to theorizing presence distinguish between distinctive dimensions. Zhao (2003) explains that there are various dimensions of presence that carry subtle differences in meaning and context. For example, in general terms, immediate or physical presence refers to one's concrete bodily situatedness in a certain place and time. Waterworth and Waterworth (2003) write that presence ultimately resides at the most basic level of concrete embodied experiences of external worlds. They claim that 'our internal worlds and their meanings are built on the foundation of what it feels like to be consciously in a concrete external world, on what it means to be present' (para. 31). Another form of presence is social presence, which refers to the connection to, and being together with, other people (Nowak and Biocca, 2003).

Presence is particularly important for learning (Ochs and Sonderegger, 2022) -- that is, for one's ability to absorb, process, retain and apply new information and skills. The potential benefits of

presence for learning processes were discussed before modern technological devices became available (Psotka, 1995; Salzman et al., 1995). The arrival of modern, mobile technologies, however, has added layers of complexity and posed new challenges to what presence means more broadly, and to processes of teaching and learning, in particular. Naturally, both presence and (outdoor) learning are affected by a wide range of contextual factors, such as individual characteristics, group dynamics, and features of the learning environment, such as the weather. Nonetheless, specific concerns have been raised about the negative impact mobile technologies might have on students' abilities to be present – to be aware, receptive, and connected to the educational context – and consequently, how these devices might influence learning processes. As argued by Misra et al. (2016), mobile, networked technologies such as smartphones, tablets, and smartwatches with Wi-Fi connectivity, are distinctive in that they enable a new state of presence, referred to as 'absent presence', or a split awareness, in which one can be physically and perceptually present while simultaneously immersed in a technologically mediated world of elsewhere (Gergen, 2002; Stone, 2007).

Networked connectivity thus gives rise to a new and more mobile conception of presence – one in which an individual's perceived presence can fluctuate (and sometimes even exist simultaneously) between concrete presence in physical spaces and absent presence 'elsewhere' in a virtual domain. Following Zhao's (2003) suggestion to focus on the different dimensions of presence can make it easier to identify and understand the factors that impact students' perceived sense of presence. Specifically, such a differentiation is necessary to understand the implications of smartphones on teaching and learning and how the sense of being a part of a technologically mediated outdoor space might impact those interactions that are so central to outdoor studies programs.

Constant connectivity and interaction interfaces

Mobile technologies being used as practical pedagogical tools have the potential to enhance outdoor learning (Veletsianos et al., 2015; van Kraalingen, 2023). However, there is increasing evidence that students' constant connectivity to non-present others through social media is what poses the biggest challenge to learning outdoors, according to both educators and students (van Kraalingen and Eriksen, in preparation). Smartphones are increasingly intertwined with many aspects our everyday lives. Rather than functioning as separate domains, smartphones and their access to connective spaces have become a kind of 'overlay' to the physical world. The postdigital era is hallmarked in part by living in a constantly connected, always available communication environment (Boyd, 2014; Jandrić et al., 2018; Reed, 2022), where 'social practices and economic and political systems' (Knox, 2019, p. 358) are entangled with digital and mobile technologies. Indeed, smartphones have arguably turned into 'all-in-one' devices, which function, for example, as personal computer, watch, compass, map, television, telephone, camera, and GPS (Misra et al., 2016). Feenberg (2019) argues that it has become nearly impossible to differentiate between digital and non-digital spaces, while more broadly, van Dijck (2013) explains that mobile devices, their applications, and constitutive connectivity create 'a

new online layer through which people organize their lives' (p. 4). It is this additional layer that 'influences human interaction on an individual and community level, as well as on a larger societal level, while the worlds of online and offline are increasingly interpenetrating' (p. 4).

Constant connectivity and communication environments are enabled by 3, 4, and 5G networks, and Norway, in particular, has a well-established connectivity infrastructure. The EU's index for digitization (DESI1) for 2020 shows that Norway, together with Denmark, scores highest on the index for mobile connectivity access (European Commission, 2020). As of June 2020, the overall 4G mobile phone coverage in Norway measured 99.9% in people's homes, with 83.6% of the total land area being covered (Kommunal-og Moderniseringsdepartementet, 2021). This shows that there are few places left in Norway without connectivity, and that students usually have access to networks on expeditions that are part of their outdoor studies.

Smartphones, and their access to networks and online resources, such as internet web browsers, online discussion forums, social networks, and a wide range of applications, have given rise to new avenues for interactions and for learning. Students and teachers are continuously involved in ubiquitous, mediated interactions – not only with each other and with the landscapes they are travelling through, but also with friends, family, and social media followers with whom they are connected through their smartphones. The point of departure for this paper is the position that smartphones and their access to networked connectivity constitute new opportunities for social interaction within and beyond the outdoor classroom, and that a deeper understanding of the implications of these interactions in outdoor education settings is needed.

Symbolic interactionism

Blumer's (1969) theory of symbolic interactionism can help us understand how humans create meaning through interactions with the material items, ideas, and people they encounter. For the purposes of this inquiry, symbolic interactionist social theory allowed us to focus directly on the ways in which students experience how smartphones affect their interactions with others (present and not present), as well as with their physical, natural environment. According to Blumer (1969), humans are constantly acting towards physical, social, and abstract objects. Physical objects are inanimate, such as trees, canoes, and smartphones; social objects are people; and abstract objects refer to intangible concepts such as courage or, in the case of this inquiry: presence.

Blumer (1969, pp. 2–4) offered three basic premises of symbolic interactionism. First, human beings act towards objects on the basis of the meaning(s) those things hold for them. Second, these meanings arise out of interactions one has with objects. And third, meanings are modified through humans' interpretive processes. Blumer's work rests on the shoulders of George Herbert Mead and Charles Horton Cooley, who were the 'original' interactionists, along with John Dewey – all of whom were colleagues at the University of Chicago. Dewey's concepts of interaction and continuity will not be discussed in this paper, as they are so comprehensive on their own that they will be used in a forthcoming paper to further examine the same dataset.

Writing in 2010, Beames argued that 'everyone on an expedition is constantly constructing meaning and shaping social life through interaction with other people and the conditions in which they find themselves' (p. 31). Blumer's (1969) premises underpin a theoretical framework that lends this inquiry the analytical tools needed to more deeply explain how individuals, through interactions with objects, have internal conversations which enable them to interpret and transforming meanings of what they perceive 'in light of the situation' (p. 5). Later in the paper, the symbolic interactionist framework will be explicated in more detail and employed to further interrogate the findings.

Methodology

The principle aim of this inquiry was to gain a deeper and more nuanced understanding of how outdoor educators and students experience the ways in which smartphones are influencing human-human and human-nature interactions during outdoor teaching and learning activities. Drawing upon a social constructivist view on learning (Watson, 2001; Løvoll, 2019), this inquiry employed a collective case study approach that examined data collected from three outdoor studies bachelor degree programs in Norway. A collective case study is an inquiry comprising several cases to examine a 'phenomenon, population, or general condition' (Stake, 2000, p. 437). This methodology allowed us to analyze multiple cases in-depth (Baxter and Jack, 2008) and generate a broader understanding and appreciation of the issue under study. Twelve educators (E) and 27 students (S) were interviewed in total across the three programs. At the first institution, six educators and nine students were interviewed, while three educators and nine students were interviewed at the other two. All educators were experienced in the field of outdoor education. As students were selected from the second and third years of the outdoor studies degree, they all had prior experiences with outdoor activities from their first year in the program.

Purposive sampling allowed us to select participants based on their capacity and willingness to offer firsthand perspectives on the use of smartphones in Norwegian bachelor programs in outdoor studies from 2020 to 2022. This method of sampling was deemed suitable, as the aim was to gain an in-depth understanding of individuals' experiences and perspectives, as opposed to a more general nomothetic understanding (Ishak et al., 2014), which principally centers around objectivity and prediction. The data set is of sufficient size ($n = 39$) to provide insights that can be generalized (Stake, 1995; Smith, 2018) by educators, practitioners, and others concerned with the use of smartphones in outdoor learning contexts.

Ethical approval was obtained from Norwegian Center for Research Data (NSD) prior to data generation. The participants in the study were given information sheets and written consent was obtained from each person (Thorne, 1980). Participants were given the right to withdraw from the study at any stage without any negative repercussions (Orb et al., 2001). To ensure data security, the raw interview data was stored in a password protected folder. During denaturalization (see the data analysis section), personal identifiers were removed (Lin, 2009). Finally, participants are referred to with 'they/them' in the presentation of the findings to avoid participants being recognized by gendered pronouns.

Data generation

The first author was responsible for data all generation, which took place in-person and through Zoom. Individual interviews were conducted with educators, as this allowed the first author to explore the participants' thoughts, experiences, and perspective in-depth and obtain more detailed information (Marshall and Rossman, 2016). Furthermore, it was considered that educators might feel more comfortable expressing their opinions without the presence and influence of colleagues. Focus group interviews were used to generate data from the students, as group settings can create a comfortable setting for students to recall experiences and discuss responses (Williams and Katz, 2001; Marshall and Rossman, 2016). Each focus group was composed of three students. All individual and focus group interviews were conducted in English.

The interview questions broadly revolved around three themes stemming from a systematized literature review conducted by the first author (van Kraalingen, 2023): values and learning objectives in outdoor studies in higher education, perceptions about the connectivity afforded by smartphones, and views on the influences of smartphones on interactions in outdoor learning activities in general. The topic guide ensured that similar topics were probed in each interview, while allowing flexibility for the interviewer to ask follow-up questions and 'tap' into unanticipated responses.

Data analysis

All interviews were audio recorded and manually transcribed verbatim. The analysis aimed to investigate both explicit and implicit patterns of meaning within the data (Clarke et al., 2015, p. 226). This process was guided by the principles for conducting reflexive thematic analysis (RTA) as outlined by Braun and Colleagues (2016) and Braun and Clarke (2019). While thematic analysis (TA) is a widely used as an analytical approach to qualitative data, there is considerable variation in how the approach is interpreted and executed, as noted by Braun and Clarke themselves (Braun and Clarke, 2006, p. 78). They raised concerns about TA being applied as a one-size-fits-all method and consequently reframed their initial approach to TA as RTA.

While it is important to acknowledge that RTA does not entail following a fixed set of predefined stages, for the purpose of clarity, and drawing directly from Braun and Colleagues (2016) and Braun and Clarke (2019), the steps taken during our analysis can be broadly categorized as follows: (1) familiarize ourselves with the data, (2) do initial round of coding, (3) undertake analyst triangulation, (4) review codes, (5) match data extracts, (6) complete second round of coding, (7) group codes into code clusters, (8) draft initial themes, and (9) develop and review themes.

Further ethical considerations

Both authors were employed at one of the three institutions and were thus 'insiders' within that program. There are advantages to being an insider researcher, including starting from a baseline of knowledge which would take an 'outsider' a long time to accumulate (Mercer, 2007; Fleming, 2018). However, being an insider comes with its own challenges, such as remaining aware of the

intertwinement of one's role as employee and researcher (Floyd and Arthur, 2012). Further, van Heugten (2004) points out that insider research is open to accusations of bias and subjectivity. While bias is an important ethical concern in all research, it can be argued that the risk of bias is more strongly present in the case of insider research (Drake, 2010; Unluer, 2012), not least during the processes of interpretation and presentation of the data. In order to minimize such biases, two external colleagues independently coded two excerpts from the interview data. Although from the constructivist view employed in this inquiry there is no one 'true' or 'valid' interpretation of the data, analyst triangulation offered a useful soundboard for bouncing perspectives and as an important additional means for reflexivity (Braun and Colleagues, 2016; Braun and Clarke, 2019). Stake (1995) posited, 'It is my integrity as a researcher that I beg to be recognized, that my interpretations be considered' (p. 76). Our data have been analyzed through a very rigorous process and we now present findings that we consider to be trustworthy.

Findings

Two overarching themes emerged as being central to presence and interactions in the outdoor classroom: perceptiveness and attentiveness. The first theme of perceptiveness refers to how when students are present and engaged in the moment, they are more perceptive to sensory experiences in and from nature. Perceptiveness thus illustrates the connection between presence and interactions between students and nature. The second theme, attentiveness, illustrates the significance of presence in relation to students' attentiveness to peer interactions in the outdoor classroom. Attentiveness to the social environment emerged as being crucial for students' active participation in collaborative activities and for engaging in meaningful interactions with their peers.

The notion of presence manifested repeatedly in interviews and focus groups, and participants' sense of presence came forward as an important prerequisite for meaningful interactions – those between students and the more-than-human world, and those between students and their peers. In this context, the meaning of presence can be (re)defined as a state of being fully perceptive and attentive to the present situation, including both the natural environment (i.e., outdoor classroom) and social environment (i.e., peer interactions). We will now turn to discuss each of these themes and how they are influenced by smartphones.

Perceptiveness

The importance of sensory perception in outdoor learning experiences was at the forefront of the data derived from interviews with educators. For example, participants stated that 'nature experience is when you are absorbed with nature and fully immersed' (Marin (E)), and 'for me, embodied learning is very much about being very present, with all your senses' (Rene (E)). We were taken by the description of the importance of sensory perception given by Jayce (E):

> The landscape is more than a view. The landscape is also tactile. The landscape is also voice: you can hear the river that you don't

see, but you can see it on the map. I see it on the map, and I can hear it. And if the wind is coming this direction, or that direction, the sound will be different, but it's all loaded with information if you learn how to listen and be present.

The quote above illustrates the importance of tactile and sensory experiences in outdoor learning. More than merely knowing one's position in the landscape based on the numeric information of latitudes and longitudes, one learns to read and sense the landscape (Loynes, 2004).

Extant research indicates that being immersed in nature, and learning in, through and about the natural environment, can contribute to foster an affinity for nature, or a sense of connectedness with it (Lugg, 2007; Colléony et al., 2020). Nowadays, a wide range of mobile applications can help identify plants, flowers, trees, insects, animal tracks, and so on. Previous studies have shown that the use of smartphones can help to foster learning to make connections between observations in nature to specific course content (Kacoroski et al., 2016; Zimmerman et al., 2019). However, as Kit (E) argued, the use species identification applications might increase students' knowledge of nature, 'but not necessarily the connection' to it.

Participants consistently indicated that they do not believe it was possible to fully reconcile smartphones with the sensory, embodied experiences that are considered valuable for outdoor learning processes. Charlie (E) gave the example of a digital fieldtrip that was recorded during the COVID-19 pandemic when students were unable to attend the trip in person.

> To explain friluftsliv on film and through mobile technology is giving such a flat picture of what we're really doing, because you can't be there. You cannot touch the water, you cannot talk with the people, or feel the smoke from the fire, and many more things.

There are various ways in which educators facilitate sensory experiences in nature. For instance, Zion (E) explained that the moment the group arrives at the location and the actual trip begins, they ask the group to shift their focus and attention to the present moment, place, and group. They referred to this deliberate transition as 'going from asphalt to moss'.

Another example from the data was a 24-h, technology-free period where students spend time in solitude outdoors to deepen their experience in nature, tune in to nature's rhythms and interact with the landscape through the senses. While most students stated that they enjoyed this opportunity to reconnect to nature, for Alex (S) and Ri (S) it was challenging to be disconnected from cellular services, and they experienced boredom and a sense of uncertainty. These experiences seemed to be exceptions, however. Interestingly, multiple students expressed how they felt that some educators assumed young people enjoy being on their smartphones all the time. However, as Luca (S) illustrated, students also enjoy time away from their technologically structured lives:

> When I look back at our trips and our hikes during this this year, the best experiences were when, for example, we were out paddling during the night. And of course, we didn't have our phone and we couldn't even take pictures, but I felt like those

> moments were stronger and more meaningful than the ones where I could take out my phone.

The data shows that being present and experiencing nature through the senses, are highlighted as being important aspects of outdoor teaching and learning experience by both educators and learners. Approaching the human-nature interaction from the theoretical position of symbolic interactionism, Blumer (1969) builds his scheme of symbolic interactions on the concept of object, which refers to anything that can be sensed, known, or thought about. Accordingly, there is the potentiality of anything in the world to become a meaningful object through interaction with it. Leaning on Azarian (2023), we assert that nature and features in nature are no different than other objects in the world in 'that they too can become objects charged with meaning and can be experienced as such by people who relate to them' (p. 9). Following Blumer's thinking, the natural environment is more than merely an unproblematic physical settings or backdrops for social interactions and activities. Instead, through interactions, the natural environment can become charged with meaning. That is, it becomes more than something that can be 'only fleetingly observed on the landscape, a locale, or setting for activity and social interaction' (Giddens, 1979, pp. 206–207; quoted in Pred, 1984, p. 279). The distinct meanings of the natural objects then emerge through the 'engagement with people's consciousness, intentionality and sensibility' (Azarian, 2023, p. 10). As the findings within this theme demonstrate, sensory interactions are regarded as being important for meaningful experiences of nature and for (re)connecting with nature.

The data further indicates that smartphones influence human-nature interactions by diminishing our sensory experiences, through interfering with our ability to be fully present and able to sense the natural environment. The use of smartphones thus mediates, as Ritter (2021) writes, 'how we are – perceptively – in the world' (p. 14). For the students who participated in this inquiry, the strong focus on the experience in and of nature is one of the fundamental aspects they appreciate about the outdoor studies program. Fourteen out of the 27 students explicitly stated they would be interested in taking part in more outdoor learning activities without smartphones.

Attentiveness

Alongside the narrative of presence by means of physical perceptiveness, the second principal theme that was identified was attentiveness. Attentiveness refers to students' cognitive presence and attention given to their social surroundings. The influence of smartphones on people's attentiveness in social interactions is extensively documented (Przybylski and Weinstein, 2013; Misra et al., 2016; Allred and Crowley, 2017).

One of the primary findings under this theme is that educators and students experience a notable difference in the group social interaction when there is no available connection to a mobile or cell network. Participants indicated that they generally experience stronger social engagement with, and connection to, classmates while disconnected from their phones. For instance, Noel (S) stated in a focus group interview that,

> I think it depends a lot on if there is 4G or not. If there is reception, then you would see a lot more people sitting on the phone checking and using Facebook and Instagram. But if there's no reception, people automatically start to try to talk more with each other and help each other out.

The example above shows that students are more focused on collaboration and more present in peer interactions when there is no connection to online networks. For another student, Luca, using the smartphones gives them a sense of being present in two places at the same time. They further explicated that 'it takes lots of attention to be able to contact others, and being available for people to call you, that it's possible to kind of switch in and out of being on the trip'. This example illustrates students' fluctuation between immediate presence (Zhao, 2003) and absent presence (Misra et al., 2016), and showcases how smartphones can negatively impact their attentiveness to one's immediate surroundings. This decreased attentiveness enables one to maintain a cognitive presence 'elsewhere' online, while maintaining a physical presence in the outdoor classroom. This switching in and out of being on the trip can disrupt individuals' sense of presence, as well as the dynamic interactions within the group. This finding is consistent with the view offered by one of the educators, Reese, who explained that 'it becomes quite clear to them (the students) that phone use is affecting the rest of the group. It's not only you looking at your phone, it's also you looking away'. The description of someone 'looking away' points to the importance of people's body language. Jalen (S) identified the same issue with regard to how someone's body language changes when one is interacting with a smartphone:

> When you look at your phone, at least in my perception, that tells me something about this person maybe doesn't want to be here in this setting or is at least not trying as much as the others to engage with this setting. And that might not be the case, but that's my perception when people are on their phones.

What stood-out to us, as illustrated by the quote above, was how students picked-up on each other's body language, which in turn affected their interaction and engagement with the group. Blumer's (1969) third premise is helpful in explaining how students' perception of their peers' body language influences the meanings they draw from social interactions – or the lack thereof – and subsequently influence how they (re)act. Thus, from a symbolic interactionist point of view, people shape their behavior by grasping one another's perceptible cues. An important aspect of the interpretation of perceptible cues is that students might perceive a peer's use of their smartphones as being for personal purposes, while it might well be for the purpose of checking the weather forecast or writing a reflection note (Hills and Thomas, 2021).

In this instance described above, a student looking down at their phone is perceived by their audience having put up a barrier to dialogue; they are, in effect, 'closed'. This interpretation then informs how someone acts, which, in this instance, may result in a student who is not using their phone deciding not to start a conversation with a student who is. In other words, when a student is using their phone, it might send a message that what they are doing is more important than their peers or what is happening in their surroundings. Following Blumer (1969), it is through interaction with a given set of social circumstances (e.g., other students using their phones while in

camp), that the meanings students have for their natural surroundings and their relationships with other people are being modified through an interpretive process. Similarly, Capozzi and Ristic (2018) argue that perception facilitates attention to social cues, while through the process of interpretation, people link attention with understanding the social meanings of cues. The authors further explain that 'reciprocating someone's gaze may signal social interest, creating an opportunity for an interaction. In contrast, looking away may signal an absence of social interest, ending an opportunity for an interaction' (p. 1).

It is important to highlight that participants underlined that smartphones are most often used during free time or breaks from pedagogical activities. While such moments are not explicitly directed towards concrete learning objectives, they can still provide valuable opportunities for acquiring other intended learning outcomes, such as those to do with social and personal development. This argument was most clearly illustrated by Reese, one of the educators, who described a situation during a canoe trip when a group of students paddled into shore and took a short break to eat and rest before carrying the canoes across a stretch over land. They explained that such a break is usually a good time to experience the place and 'to help or check in on each other', but that they noticed how on this trip that 'students quite often just sat down and took out their phones'. Reese continued:

> I think that is a problem, because that kind of goes against, maybe not necessarily the learning objectives, but just as important as the learning objectives are the dynamics in the group. If they just sit with their phone, I think they're missing out on something.

The quote above indicates that the impact and presence of smartphones may interfere with the development of community and outcomes related to building mutual support, care, and trust (see Quay et al., 2000). All of the students indicated that it is mostly during these moments of 'free time' that they do sometimes take up their phones for personal communications. As described throughout this section, students notice a change in the dynamics of the group when online networks are available; they feel that smartphones can pose a barrier to their attention and thus to peer interactions. However, smartphones also carry important meanings for students in terms of connections beyond the outdoor classroom. This ties into the second central finding under the theme of attentiveness.

From Blumer's (1969) symbolic interactionist perspective, we can see how students interact with their phones based on the meaning they have for them. One central meaning of smartphones today is that they are also cameras that can take pictures and video. Interestingly, the act of taking a photo was not considered problematic by any of the participants. For educators, taking photos was mainly considered from a pedagogical perspective, for example, for use in field diaries in which students reflect on and demonstrate their learning. The documentation of experiences through, for example, pictures or videos, functions like a 'memory base', as Odd (E) described it. Sharples et al. (2005) highlight how documenting and sharing experiences in mobile learning contexts can contribute to the continuity of the learning process beyond the classroom. They argue that records of learning through video, pictures, or notes, can serve as means to recall memories and be used for later reflection. Drawing

on Dewey (1938/1998), who placed a strong emphasis on continuity in education, it can be argued that the documentation and sharing of experiences contribute to the continuity of the learning process that began long before the actual outdoor learning episode started and may (hopefully) continue long after it.

For students, however, the act of taking photos raises a more complex matter. Six students stated that sharing photos and stories about their time on trips adds meaning to their experience because it can give friends and family a glimpse into what they are experiencing and thereby increase a sense of closeness to them. In line with this, a study by Rivière (2005) shows that sharing photos with non-present others 'operates at the level of emotional perception and increases our capacity for emotion and to feel 'together' (p. 174). This resonates with a study of Taiwanese college students, which found that smartphones facilitated the symbolic proximity to valued persons and strengthened familial bonds and social relationships (Misra et al., 2016). In particular for Gen Z, smartphones provide an unrestricted sense of connection to wider social networks (Boyd, 2014; Twenge, 2017).

On the other hand, however, nearly half of the students simultaneously indicated that keeping in touch with non-present others through social media comes with peer pressure that takes energy. This was illustrated by Jamie (S):

> We always think about how other people see us on Instagram and Snapchat and that we're having the best time of our lives, and that kind of stuff … And that's exhausting for our brain. So, we need to be more connected with nature and not care so much about what other people think.

Jamie's experience illustrates a challenge that does not directly involve the act of taking a picture of or recording an experience, but one that regards the meanings that smartphones carry through their access to constant connection and access to social media. These meanings go beyond documenting experiences for the purpose of memory-keeping and extend towards issues of sharing experiences in relation to identity and belonging to social groups. Blumerian interactionists are interested in humans' interactions with physical, social, and abstract objects (1969). In the above quote, Jamie is referring to his interactions with abstract objects. This consideration of what other people might think of him posting certain images to social media, shows how Jamie is not only interacting with people and place, but with more abstract notions of what is appropriate action to take in a given social situation. This also points to forthcoming work by Reed (in review), which suggests that even if phones are not out and social media is not being accessed, smartphones, applications, and algorithms continue to shape human interaction. Jamie's comments above are also noteworthy because they demonstrate what Cooley (1964) referred to as the 'looking glass self', whereby one's actions are guided by the imagined responses to one's actions by their social groups. Cooley explains how this involves 'the imagination of our appearance to the other person, the imagination of his [sic] judgment of that appearance, and some sort of self-feeling' (p. 184). Jamie is explaining how this process of wondering what other people will think of their social media posting behavior is exhausting. Indeed, Bibizadeh et al. (2023) explain that young people have 'paradoxal relationship' with technology and social media, 'because they feel both free and unfree online' (p. 1).

Another example was given by Alex (S), who explained that they do not necessarily want to 'communicate all the time while we are on a trip' but that they are 'so used to checking the phone' and updating friends about what they are doing. Alex further stated that 'it is difficult not to [take out one's smartphone] when people are sitting on their phones around camp'. This example given by Alex highlights two important points: first, the entrenched habit of communicating with close persons through social media; and second, the challenge of not using the smartphone when others in the group are doing so.

The second finding within the attentiveness theme demonstrates that while students notice that smartphones reduce their attentiveness and can place a barrier between peer interactions, they also recognize that their smartphones are infused with meanings, habits and social norms. This finding demonstrates how the role of smartphones is perhaps even more complex than previously thought. We recognize that networked connections enabled by smartphones can offer new and different ways of socializing and making meaning of experiences. Smartphones are personal devices that can give both teachers and students a sense of connection to home while being on the move. The communication afforded by mobile devices is thus not always instrumental, as Johnsen (2003, p. 164) argues, but rather can be used to establish and sustain fellowship. More than two decades ago, Townsend (2000) described the mobile phone as the umbilical cord of networked society. Building on Townsend's perspective, Johnsen (2003) writes that individuals and their everyday practices are deeply intertwined with mobile phone use, and argues that they cannot let it go, 'because it is their primary link to the temporally, spatially fragmented network of friends and colleagues they have constructed for themselves' (p. 164). Mobile devices, social media networks, and digital infrastructures are being 'pulled' into people's bodies (Johnsen, 2003).

Indeed, social media platforms, like Instagram and Snapchat, have become important avenues for social interactions among young people today. However, it is important to stress that this is not necessarily experienced as positive by students, in particular during outdoor trips. Nearly all of the students who participated in this study underlined that the 'offline' moments away from their smartphones during field trips are highly valued and that they experience a stronger social connection within the group in those instants. In other words, they experience a stronger connection when they are present in the moment with the group, through disconnection from their devices and online networks.

It is important to acknowledge that the data also showed how smartphones can also have a positive impact on interactions and be beneficial for student learning. Jaden (E) explained how they use certain applications with students to discuss what is on their screens and thus create a more shared experience. One primary example given repeatedly by educators is checking and discussing the weather forecast with the group. Another example, given by Rene (E), was an activity in which students had to co-create a mini documentary in the format an Instagram story, in which they would present edible food that can be found around the coastline. These examples show how smartphones can facilitate students' participation in disciplinary dialogues and practices. Moreover, a study by Mills et al. (2013) showed that learning through video production involved co-presence with peers and community members to generate knowledge about local places. These productions can then be shared with global others in a kind of place-based information exchange (Hawkins, 2014). The above examples resonate with Brown et al. (2016) more general

argument that there is increasing potential for the use of technology and social media for creative production in education.

Discussion

Blumer's (1969) symbolic interactionist perspective emphasizes the importance of meaning-making through interaction with social, physical, and abstract objects. From this perspective, people's behavior is influenced by the meanings they attribute to the world around them through shared experiences. As the examples from the findings show, smartphones are infused with meaning in people's social interactions and cultural practices. Turning to literature on the cultural significance of smartphones (and their applications) have become cultural tools for symbolic expression (Al Zidjaly and Gordon, 2012) and of people's identity (Carter et al., 2013), social status (Green, 2003), and connection to others; they facilitate communication and social connections and enable us to construct and share personal narratives and representations of self through social media and online platforms (Gündüz, 2017). Accordingly, our interactions with and through smartphones have become an integral part of how we perceive our surroundings and how we interact with other people. As such, smartphones have changed the nature and meaning of how we interact with and perceive our everyday environment, and they play a major role in how people create new meanings out of experiences.

The findings show that the impact of smartphones on the social dimension is two-fold: first, while in the pedagogical setting of the outdoor classroom, smartphones can, in some instances, contribute to collaborative learning and dialogue; both educators and students indicated that the use of smartphones markedly reduces students' attentiveness to the social dynamics in the group. Second, using smartphones to share experiences with non-present friends and family can amplify the positive meanings of the experience and maintain a sense of closeness with non-present others. With regard to previous studies (Vesnic-Alujevic, 2013; Allen et al., 2014), the findings suggest educators should be careful not to undermine or underestimate the value of connective media in the lives of young people. However, in the pedagogical setting of the outdoor classroom, interactions between students are a crucial part of the learning process, and the findings highlight how it is important for outdoor educators and practitioners to critically consider the influence of smartphones on students' perceptions and attention.

This present study is not the first empirical inquiry to highlight how smartphones influence social interactions. A study by Przybylski and Weinstein (2013) revealed that smartphones 'can have negative effects on closeness, connection, and conversation quality' (p. 237). Their data demonstrate that even the mere presence of smartphones can interfere with human relationships. Ari (E) stated that they find the students surprisingly good at understanding that 'it's a social media free zone when we are outside', and that 'they do not need to read Snap, TikTok, or the newspaper, every second'. While most of the educators shared this view, more than half of the students expressed that it is not uncommon for their classmates to take out their phones almost immediately when the group sits down to have a break. Despite this, the findings showing the negative influence of smartphones students' attentiveness to peer interactions highlight the importance of carefully considering how smartphones are managed in the outdoor classroom. To mitigate the impact of smartphones on the social

dynamics in the group, as explained by both educators and students from all three institutions, students are encouraged to have conversations which will enable the co-construction of norms around the management and use of smartphones while outdoors.

All students expressed a strong interest in connecting with nature and placed a high value on social bonding within the group. They also expressed willingness to participate in more activities in which smartphones did not play a role. Tertiary outdoor education programs arguably have much potential in terms of offering a novel environment for learning – one that is removed from distractions of modern life, and which deeply contrasts with contemporary society that has been characterized as 'liquid' (Bauman, 2007) and 'mobile' (Elliott and Urry, 2010). A certain disconnection from smartphones and social media networks can have a positive effect on attentiveness, and reduce feelings of distress associated with, for example, social demands and time pressure (Radtke et al., 2022). The constant connectedness in today's postdigital society might increase the need for deliberately creating 'offline spaces' in green areas. The findings of this inquiry suggest that outdoor education remains a valuable space for developing those embodied relations through being present and connected to people and place in the here-and-now. Further, it can be argued that the outdoor classroom offers a vital contrast to the social world which is heavily mediated by smartphones and networked communication infrastructures.

Limitations

In addition to the potential challenges related to insider research that have been discussed earlier, this findings from this inquiry are limited in their capacity to be universally useful. However, they do provide new insights into the perspectives and experiences of educators and students from three different higher education institutions that have outdoor studies bachelor's degrees. According to Stake (1995), in any case study there may be recurring responses, issues, or activities that allow for some reasonable generalizations to be made during the research process, which could potentially be useful in other contexts. Stake (1995) refers to these as 'petite generalizations,' which are understood as 'generalizations about a case or a few cases in a particular situation' (p. 7). To avoid any confusion between generalizability and transferability and to maintain consistency with the qualitative aspects of credibility, we argue that the findings of this inquiry may contribute to the development of petite generalizations, based on the assumption that recurring patterns of meaning regarding the challenges associated with the use of smartphones could have relevance beyond the initial case presented in this paper. Institutions with similar programs and network coverage to the ones studied here may be well positioned to make what Stake labelled 'grande generalizations' (p. 7).

Implications and conclusion

This paper has provided a glimpse into the importance of presence for students' interactions with their peers and with the natural world. The findings of this paper show that being present, perceptively and attentively, are essential to learning processes in any context, but in outdoor studies particularly, where interactions between students, their peers and the natural environment are central to the learning process (Bischoff, 2000; Tordsson and Vale, 2013). Blumer's (1969) symbolic interactionist perspective has helped to highlight the embedded meanings that smartphones hold in today's societies, as well as the complex ways in which smartphones might affect interactions in the outdoor classroom. The findings suggest that smartphones have a strong impact on students' perceived sense of being present and can pose barriers both to interactions with the natural surroundings and with their peers. The findings further demonstrate that the influence of smartphones on presence and interactions largely depends primarily on whether there is networked connectivity.

Two themes – perceptiveness and attentiveness– were identified as dimensions of presence and offer a deeper and more nuanced way of understanding the concept of presence in outdoor studies contexts. We know that learning is 'fundamentally experiential and fundamentally social' (Wenger, 1998, p. 227) and the experiences of educators and students illustrate that smartphones can pose challenges to the way students allocate their attention during teaching and learning activities and in their free time, while on trips. With regards to perceptiveness, the findings show that smartphones can reduce students' sensory perceptions of the immediate natural environment, thereby altering key elements of their outdoor learning experience, and contributing to a fluctuating sense of presence or 'absent presence' among them.

In terms of the second theme, attentiveness, the influence of smartphones revealed itself to be more a complex topic of discussion. While smartphones can be used to facilitate collaborative learning and dialogue between peers, the findings clearly indicate that educators and students experience that smartphones reduce students' attention to the group and negatively impact peer interactions. Conversely, smartphones carry significant meaning, in terms of facilitating communication with and enabling students to maintain a connection to non-present others. At the same time, however, the findings show that students also experience pressure and exhaustion from thinking about what they could and should share and how that might be perceived by their social media communities.

While recognizing the value of using smartphones to connect and share experiences with non-present others, the participants of this study, and students in particular, supported having outdoor learning experiences without smartphones as a means of encouraging them to take a break from smartphones and focus more on their relationships with classmates and place. The findings indicate that the ongoing technological developments that characterize today's postdigital society might increase the need and desire for dedicated 'offline spaces' or 'offline periods' to be offered in outdoor studies programs. It is therefore imperative to encourage mindful use of smartphones in the outdoor classroom and to be clear about when meaningful human-human and human-nature connections, and disconnection from smartphones, should be prioritized.

Data availability statement

The datasets presented in this article are not readily available because restrictions apply to the availability of these data based

on the national regulations under which this research is conducted. Requests to access the datasets should be directed to imrevk@nih.no.

Ethics statement

The studies involving humans were approved by Norsk Senter for Forskningsdata (Data)/Norwegian Centre for Research Data. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

IV: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. SB: Supervision, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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