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Hiking in the wilderness: Interplay between teachers' and students' agencies in outdoor learning

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Abstract

This study aimed to find out the ways in which teachers' and students' agency emerge in outdoor learning and in which ways students' agentic engagement could be promoted and supported. Outdoor learning is defined here as cognitive, emotional, social, physical and educational processes designed for and taking place in natural contexts. The study was conducted during a three-day hiking course taking place in the wilderness of Finnish Lapland. The participants were 21 upper elementary students and their two teachers. The research data consists of qualitative interviews recorded during the hiking trip, audio-recorded field notes and students' digital diaries. The data were analyzed qualitatively. The findings indicate four aspects of students' agentic engagement, which are promoted through teachers' agency emerging through evoking past experiences, future orientations and being closely engaged with the present. The results provide evidence to support developing outdoor learning pedagogies particularly in terms of promoting generic skill development, students' sense of agency and self-directed learning in authentic settings.

Keywords: agency, agentic engagement, outdoor learning, upper elementary school, curriculum

Introduction

Increasingly, outdoor education is seen as an integral aspect of worldwide educational reform. In Denmark, for instance, over 10% of preschools are located in forests or other natural settings (Stasiuk, 2016), while Singapore has strongly contributed to the development of outdoor education by building green outdoor spaces that teachers can utilise (Tan & Atencio, 2016). Many countries have enabled outdoor learning practices by renewing curriculum, providing related programmes, supporting teachers and increasing their decision-making responsibilities. The aim of new curricula is to focus on students' competencies, positive dispositions and capacities (Caena, 2014). Tan and Atencio (2016) state that outdoor education has increasingly gained attention within school settings, especially as a tool for utilising outdoor experiences for various educational purposes. In the research literature, outdoor learning usually describes learning that occurs outside classrooms, often in settings involving nature. Outdoor learning can encompass a range of activities and such concepts as outdoor play and recreation, environmental education, adventure activities and outdoor adventure (Mackenzie, Son & Eitel, 2018; Tan & Atencio, 2016). In the research setting presented in this article, outdoor learning refers to educational processes and learning experiences designed for and taking place in natural contexts in the Finnish arctic wilderness.

The Finnish National Core Curriculum for Basic Education was renewed in 2014; increasingly, teachers are encouraged to use a variety of schools' outdoor facilities, such as local nature settings, for the teaching of various subjects (FNBE, 2016). The focus of teaching and learning shifted towards phenomenon-based learning and multidisciplinary learning modules. For the first time in Finnish history, the core curriculum also defines competence areas that must cover each school subject (Vitikka, Krokfors & Rikabi, 2016). This means that in the curricula, students' transversal competences are linked to subject-specific objectives. Transversal competencies refer to an entity consisting of knowledge, skills, values, attitudes and will (FNBE, 2016, p. 21). One aim of the reform in Finland is to foster students' agency and active participation and promote their learning in real-life situations.

In the ongoing educational change, providing students with opportunities to experience competence and success is considered important, as it strengthens their self-esteem and guides them to recognise their personal strengths and uniqueness. In addition to subject-specific learning goals, outdoor learning in arctic nature can promote developing competence areas relating to a sustainable way of living and issues of wellbeing and health as well as bolster students' problem-solving and ethical thinking competencies. As a multi-layered concept, competence development thus comprises cognitive, skill-based and affective components that include knowledge, skills, attitudes, values and ethics (Binkley et al., 2012; FNBE, 2016). When agency is promoted, the competence areas are assumed to be developed. Often, promoting students' competences means giving them agency, i.e. supporting their own will and initiatives and enabling them to experience being active and responsible agents (e.g. Edwards, 2007; Greeno, 2006).

Numerous studies have demonstrated the benefits of outdoor learning for students' social, academic, physical and psychological skills, and their general wellbeing (e.g. Becker, Lauterbach, Spengler, Dettweiler & Mess, 2017; Mackenzie, Son & Eitel, 2018). As 'living laboratories', outdoor learning environments can thus contribute to several aspects of education, including academic, social and life skills (Bowker & Tearle, 2007; Desmond, Grieshop & Subramaniam, 2004; Lindemann-Matthies & Knecht, 2011). Further, curriculum-based outdoor learning activities provide significant possibilities for promoting students' agency (e.g. Kangas *et al.*, 2014), and student–student and/or student–teacher interaction (e.g. DeWitt & Hohenstein, 2010; Waters & Mynard, 2010).

Beyond aiming to increase outdoor education, recent educational reform has focused on supporting teachers' decision-making responsibilities and understanding to fully engage with learning processes underpinning outdoor learning activities. In Finland, alongside the renewed core curriculum, teachers are encouraged to use multiple methods and outdoor learning environments in their teaching. Some teachers act as forerunners and carry out innovative education providing examples for other teachers who are just starting to develop their educational practices, related for example to outdoor learning. Finnish teachers are allowed to design and organise school activities quite freely and choose their teaching methods, materials and spaces for teaching and learning. Recent research shows they are committed to promoting learning, participation and active agency in their pedagogy, and strongly involved in the construction of their own local school-level curriculum (Toom & Husu, 2016). However, teachers' agency in outdoor teaching and learning contexts is less studied so far.

Despite the existing research evidence about the benefits of outdoor learning and promoting students' agency in out-of-classroom settings, research on students' or teachers' agency in natural and arctic outdoor learning contexts is scarce. Observers acknowledge that teachers' pedagogical and emotional engagement is crucial for how students experience learning (Kangas, Siklander, Randolph & Ruokamo, 2017). Engaged teachers put students, their thoughts and activities at the centre, creating opportunities for students' agency building. We assume that teachers' pedagogical choices have a great impact on students' learning experiences, especially in the arctic and wilderness settings, which challenge not only students but also teachers on physical, emotional and psychological levels. Many researchers have explored either students' or teachers' perspectives in outdoor learning, but less is captured from both teachers' and students' perspectives from shared outdoor experiences.

The purpose of this paper is to investigate *students' and teachers' agency during an outdoor nature-based hiking trip in Finnish Lapland*. The hike took place in a nature park within an upper secondary school curriculum. The study aims to explore in which ways students' and teachers' agency – especially agentic engagement – manifest during three days' hiking and learning in arctic wilderness. This purpose is realised in investigating how students' and teachers' agencies interplay and the ways students' agency is supported by the teachers. The research context is

provided by the school, whose long-term mission by some agentic teachers has been to develop the school practices and its pedagogy, integrate more outdoor learning into the school curriculum and, through organising a yearly hiking course, provide a possibility to promote students' life-skills and agency.

Outdoor learning in education

Recently, outdoor education has gained greater attention in the educational research field. In general, outdoor education is described as teaching and learning in an outdoor and/or out-of-school environment. However, how the concept of outdoor education is defined depends on the context (Becker, Lauterbach, Spengler, Dettweiler & Mess, 2017). One research area relates to general outdoor education programmes, others to outdoor learning within the specific school curriculum. In this research, outdoor learning is defined as cognitive, emotional, social, physical and educational processes designed for and taking place in natural contexts. That is, outdoor learning a) uses natural and cultural environments, b) highlights the interplay of cognitive, emotional and bodily activities, c) is built in socio-cultural interaction between students, the teacher(s) and the environment, d) is based on context-specific affordances and pedagogical principles. In our research case, an annual curriculum-based outdoor learning pedagogy is implemented in the arctic wilderness that provides specific circumstances for first-hand experiences in a natural learning environment. Therefore, outdoor learning here refers more to a certain place-based pedagogical approach (cf. Tan & Atencio, 2016) than a general outdoor learning programme with the aim of promoting students' competencies.

According to Mackenzie, Son and Eitel (2018), the terminology usually varies depending on cultural aspects and geographical location. In the United Kingdom, forest schools and adventure playgrounds have gained popularity, and in North America terms such as outdoor adventure education and experiential education are commonly used when referring to programmes where outdoor places are used for different learning purposes (Mackenzie et al., 2018; Malone, 2008). Common to different approaches is that they highlight the positive effects outdoor learning has on personal and social development, physical activity and academic achievements (see e.g. Becker et al., 2017; Hattie, Marsh, Neill & Richards, 1997; Waite, Bølling & Bentsen, 2015). Much research about outdoor learning shows that learning in forests, gardens and other natural environments has a positive impact on students' self-confidence, self-esteem, co-operation and risk-taking initiatives (Bowker & Teare, 2007; O'Brien & Murray, 2007; Swarbrick et al., 2004).

Further, outdoor learning experiences have proved to be important for building self-concept, mutual trust and group cohesion and also for enhancing emotion regulation, collaboration and problem-solving skills (White, 2012). According to Ernst and Monroe (2004), nature-based education boosts students' critical thinking skills. Wistoft (2011) reported that by participating in a gardening project, the social competencies of students, such as communication skills, teamwork and understanding of the importance of taking responsibility for others' work, improved. Kangas et al. (2014) reported that learning in a natural outdoor environment promoted students' agency,

which was exercised, negotiated and distributed among the participants. Outdoor learning is considered beneficial not only for learning and agency development, but also for wellbeing in general (e.g. Humberstone & Stan, 2012). However, despite several demonstrated benefits of outdoor learning, Quibel, Charlton and Law (2017) point out there exists no agreed theory for *how* outdoor learning may improve students' wellbeing and/or academic achievement.

Teachers play a central role in implementing outdoor pedagogies. Acting as a supporter and afforder seems to be important, as does letting students behave and learn as the primary agents (Kangas et al., 2014). This usually requires pedagogical flexibility, trust and a student-centred approach from teachers. Those who have 'narrow' views (Brown & Beames, 2017) of outdoor learning see it as risky and dangerous and therefore such pedagogies aim to maintain control and predictability. The world, however, is unpredictable, uncertain and complex, thus students need problem-solving skills, collaboration and agency. Narrow pedagogical designs limit students' possibilities to learn these competences and gain agency. Outdoor learning has pedagogical potential: it can afford experiences, where students can be agentic, use and develop their personal strengths and competencies and practice general life skills. We assume outdoor learning environments can provide positive affordances, which are meaningful and important.

Teachers' narrow views of outdoor learning may stem from both practical and theoretical groundings. Carrying out a hiking trip requires teachers to closely engage in organisation and coordination. Tasks that need to be taken care of encompass not only pedagogical design and content issues, but also finding finances for the trip, recruiting voluntary teachers or parents to come along as supervisors, arranging transportation and other practicalities and ensuring safety (Mannion, Fenwick & Lynch, 2013). Given teachers' daily routines and work, these may be experienced as burdensome.

From more theoretical and pedagogical perspectives, nature can be perceived as a more intangible and unpredictable teaching and learning environment than enclosed classrooms. Staying indoors may give teachers a stronger feeling of being in control. Predicting and planning for various kinds of learning opportunities and possible challenges is more difficult outdoors, and nature as a space is constantly changing (Glackin, 2016; Lindemann-Matthies & Knecht, 2011). According to Glackin (2016), teachers who base their work on social constructivist ideas are more likely to appreciate nature's dynamic character as an authentic learning environment, but teachers who are identified with more traditional and teacher-centred approaches may be daunted by difficulties that might occur while teaching in nature. Successful outdoor teaching requires strong self-efficacy in terms of knowledge and the skills needed for a long hiking trip (cf. Schumann & Sibthorp, 2014).

Defining agency and agentic behaviour

In this study, agency is considered to be a social action that emerges when learners associate with others, including students and teachers (Engle & Conant, 2002). The research follows that of

Edwards and D'Arcy (2004), which recognises the reciprocal relationship between learners and their environment, and considers the learning environment to encompass physical, social and pedagogical aspects. More specifically, agency relates to the capacity to initiate purposeful action that implies will, autonomy, freedom and choice within the affordances of the worlds that they inhabit (Bandura, 1989; Biesta & Tedder, 2007; Edwards & D'Arcy, 2004; Emirbayer & Mische, 1998; Greeno, 2006; Holland, Lachicotte, Skinner & Cain, 1998). Bandura (2006) highlights ability and intentionality by defining agency as involving the ability to make intentional choices and action plans, design appropriate courses of action and then motivate and regulate the execution of these plans and actions. Students and teachers engaged in outdoor learning activities can become more agentic, when they have possibilities to practice these skills.

Along with agency, the concept of *agentic engagement* (Bandura, 2001; Reeve & Tseng, 2011; Sinatra, Heddy & Lombardi, 2015) gives a deeper understanding of the phenomenon in focus. Agency is considered to be a dimension of engagement (Sinatra et al., 2015). Therefore, agentic engagement suggests that participants – in this case students and teachers – are proactive during the hiking course. Although agentic engagement has been discussed primarily through studies focusing on students' proactivity, in this study, we see that it is equally important to consider how teachers are proactive while still keeping students at the centre of all teaching and learning activities and allowing them to be agentic. In this light, proactivity emerges not only in student–teacher interaction, or in subject-specific contexts or in a classroom, but between students and in integrated curriculum contexts, such as the arctic nature environment. Being proactive means that students and teachers not only react to the structures of environments and events at hand, but actively contribute by exerting their agency. In other words, they enrich, personalise, modify and request instructions, as Bandura has stated (2001).

Agency appears when a learner sees other people as a joint resource and a process that evolves in a learning situation (e.g. Edwards & D'Arcy, 2004; Edwards, 2007). Therefore, proactive and agentic engagement is built and maintained in interaction with others and the environment. In our study context, students are encouraged to actively seek issues that are meaningful in particular situations, for instance deeper understanding, explanations, new experiences, social interaction, excitement, new skills or understanding. It needs to be considered, however, whether agentic engagement is a separate dimension of engagement, or does it also include behavioural engagement (Eccles, 2016). Are there differences in indicators between agentic and behavioural engagements? Regardless of different views, dimensions of engagement, namely behavioural, cognitive/intellectual and emotional/affective/motivational engagement, are overlapping and co-occur simultaneously, playing an important role in students' experiences (Fredricks, Blumenfeld & Paris, 2004). Engagement is particularly crucial in challenging situations, in problem-solving, when self-handicapping, giving up and withdrawing may feel tempting for students and teachers, particularly if they do not feel competent (Zimmermann & Schunk, 2011). Perceived challenges and obstacles play an important role for belief profiles (Malmberg & Little, 2007), which we generalise as covering students and teachers, when defining their agency. In this study, we do

not aim to measure agentic engagement, but we use the concept as an analytical framework for better understanding the agencies of students and teachers as well as the reciprocity of those agencies' learning in the arctic wilderness.

How are students agentic?

Recent studies of students' agency in different school practices report that out-of-classroom environments can promote students' interaction and accountable forms of agency (e.g. Dewitt & Hohenstein, 2010; Kangas et al., 2014; Waters & Maynard, 2010). Both Waters and Bateman (2015), and Dewitt and Hohenstein (2010) argue that a more successful student–teacher interaction was manifested on field trips compared to traditional classroom situations. Kangas et al. (2014) found that in a curriculum-based gardening project, students' agency manifested as individual initiatives and mutual accountability, and initiatives as giving and receiving support from others in the group. Giving and receiving support can also manifest as proactive and agentic engagement, which is built in interaction. Edwards and D'Arcy (2004) point out that using the support of others and recognising the need for support is identifiable as relational agency. It involves reciprocal support and sharing by learners working together. The role of the teacher is important (Kangas et al., 2014), though as Gresalfi and her colleagues (2009) point out, there is a difference whether students are accountable only to the teacher or to their classmates, and the teacher.

Being agentively engaging usually means that learners believe in their abilities and are self-regulating, proactive and self-reflecting rather than reactive organisms (Bandura, 2001; Pajares, 2008). In the school context, students can thus be proactively engaged in their own development and make things happen by their actions, i.e. they have a sense of agency and possess the self-beliefs for acting and learning (cf. Pajares, 2008). For instance, a student shows engagement by asking or answering questions, encouraging others and bringing qualitatively new ideas, thoughts and suggestions to learning situations. In outdoor learning, students usually have more space to participate, initiate and influence joint activities (Waters & Maynard, 2010). During an intense hike trip, students' agencies are naturally given room because each must take care of him- or herself and others differently than in traditional school contexts. We assume that hiking in an arctic wilderness shows students in a new light in terms of exercising agency and strengthening their capabilities and competences. Learners' conceptions of their own capabilities relates to their self-efficacy beliefs and usually manifest as thoughts of 'can', such as 'I can cook food at the campfire'.

How are teachers agentic?

Teachers' professional agency implies active teachers who 'have opportunities to influence, to take stances, and to make choices concerning their own work and their professional identities' (Eteläpelto, Vähäsantanen & Hökkä, 2015, 662). We argue that pedagogical expertise and agentic engagement go hand in hand. Conclusions of previous studies (e.g. Siklander & Impiö, 2018) show for instance that agentic teachers have strong experience and knowledge in the field, and are capable of applying it to practice and vice versa. Additionally they can see the 'invisible' and

take necessary actions, which is important when hiking in a wilderness with students. Seeing the invisible means predictive acknowledgement of, for example students' socio-emotional challenges or other unpredictable and sealed phenomena, and dealing with them when needed.

Being agentic means that teachers are alert and aware of the intangible and the invisible, actively interacting with students and collaborating with peers, solving open problems. In this study, as teachers conduct an outdoor hiking course with their students, their agentic capacity is realised through re-activation of life and professional histories, imaginatively reconfiguring thoughts and actions in relation to their hopes and fears of the future implementation and through evaluating the present and reflecting on the demands, dilemmas and ambiguities emerging from the outdoor teaching and learning setting as a social, cultural and material structure. Biesta, Priestley and Robinson (2015) describe teachers' agency as active and emergent in nature, rooted in situated interactions between teachers and their environment. Following Emirbayer and Mische (1998), they see agency emerging through an interplay between influences from the past, orientations towards the future and engagement with the present. These dimensions of teachers' agency are titled iterative, projective and practical–evaluative, respectively.

Agentic teachers', just like agentic students', sense of agency is based on the beliefs they have about themselves and their capabilities. Qualified novice Finnish teachers perceive strong agency in their opportunities to apply and develop pedagogical practices, although the sense of agency is weaker for social management in the classroom. They feel a lack of competence in providing support for the children's psychological wellbeing (Eteläpelto et al., 2015).

Research aims and questions

In this study, we investigated how nature-based outdoor learning, specifically a hiking course carried out in the Finnish arctic wilderness, could enable students to exercise and develop their agency. Another aim was to identify how teachers' agency emerged during the hiking course. The study sought to answer two research questions:

- 1) In which ways do teachers' and students' agency emerge during the three-day hiking course?
- 2) In which ways are students' agentic engagement promoted and supported?

Methodology

Methodologically, this study focuses on one case, through which the phenomenon – agency and agentic engagement – were explored in a real-life context (Flyvbjerg, 2006; Yin, 2003) using a variety of data sources. Instead of a single lens, multimodal data provide multiple facets of the phenomenon, which is important in cases in which boundaries between the phenomenon and the context are not clearly evident (Baxter & Jack, 2008; Yin, 2003). The main justification for relying on the case study approach is its power to explore context-dependent experiences and

knowledge, which is important for two reasons, 1) students' and teachers' learning and 2) research as well.

Context-dependent knowledge and experience are at the heart of expert learning and activity, whereas context-independent knowledge forms the basis of the facts and rules of textbooks. Facts and rules provide a basis for beginners and novices, but cannot be the highest goals in learning. Experiences, knowledge and interplay between teachers and students in a natural context afford possibilities to learn more than merely factual knowledge, along with expertise (Flyvbjerg, 2006). Although the actual hike took just three days, the entire process was longer: it began with an orientation and was followed by reflection and elaboration conducted in the classroom settings. Socio-emotional and cognitive effects are more far-reaching than just experiencing the three days' activities. Students and teachers are on a learning path towards expertise (Hatano & Inagaki, 1986; Hyvönen & Kangas, 2010).

The usefulness of empirical information concerning students' and teacher' agencies depends on how the case is selected (Bennett & Elman, 2006; Flyvbjerg, 2006). We followed *information-oriented selection*, as our purpose was to maximise the utility of information from a single case. As we were familiar with the professional and personal histories of the two participating teachers and their outdoor teaching methods, we expected to obtain important information and knowledge for our study. As an educational context, the hiking course provided an unusual case, which we considered valuable to study more closely (cf. Flyvbjerg, 2006). In the following sections, the determining details of our case – the participants, context and research procedures – are introduced.

Participants

Eighth-grade upper-elementary students (N = 21) and their two teachers participated in the research. Most of the students had no previous experience of an overnight hike in the arctic wilderness. One of the teachers was a geography and biology teacher and the other one a Finnish language teacher. Both of these subject teachers were experienced in nature-based teaching and hiking. During her fifteen years' teaching career, the geography and biology teacher had organised outdoor learning, such as hiking and canoe trips around Finnish Lapland.

Procedures

The hiking course that is used here as a context for our research was conducted in the school as an annual and optional curriculum-based activity. The course followed a phenomenon-based learning and cross-curricular curriculum. It is linked to subjects of geography and biology, and the Finnish language. Overall, the course goal is to promote the students' personal growth, collaboration skills and self-esteem as well as to provide them with authentic learning experiences in arctic nature, i.e. to support the development of each student's personal relationship with nature. The course included three phases: 1) pre-phase including orientation and preparing, 2) three days' hiking and 3) post-phase including elaboration and reflecting. The pre- and post-phases were

conducted in a classroom context. Introduction and preparation included three lessons where the teachers introduced the forthcoming hiking route and the key rules for moving about and camping. Students were advised to form small groups of 2–4 students for trip preparation. The teachers guided students and groups packing a backpack and what essentials they would need while hiking, such as overnight necessities and provisions. The students had opportunities to ask questions and share their previous experiences, if they had any. The researchers participated in the last lesson before the hike and explained the aim of the research and the role of one researcher during the hike. Students and their parents were asked for an informed consent.

Ethical approval for this research was not specifically sought as it is not necessary to ask for ethical approval from the University's ethical board. In Finland, there is the "Finnish National Board of Research Integrity" which provide guidelines for responsible conduct of research and these guidelines have been followed.

The hiking trip took place in Pyhä-Luosto National Park, which is located in Finnish Lapland, about 120 kilometres north-east from the city of Rovaniemi and the Arctic Circle. The teachers and students travelled there by bus early in the morning of the first hiking day. The national park provides routes for hiking and open wilderness huts for overnight stays. In this case, there were two overnight stays during a hiking route of 35 kilometres. In total, the teachers, the students and the researcher hiked approximately ten kilometres per day with one longer cooking break. The student groups were free to hike at their own pace to the lay-bys where they had to prepare a meal for themselves, rest and also clean up the site before continuing. While hiking, students carried their own bags and items and were responsible for negotiating the responsibilities related to taking care of shared items, such as a tent and related items. There was a small wilderness hut with a fireplace in both overnight lay-bys, as well as an outdoor campfire place for cooking. In addition, all groups had a camping stove with them. The teachers and the researcher were responsible for carrying their own items and making their own food during the hike.

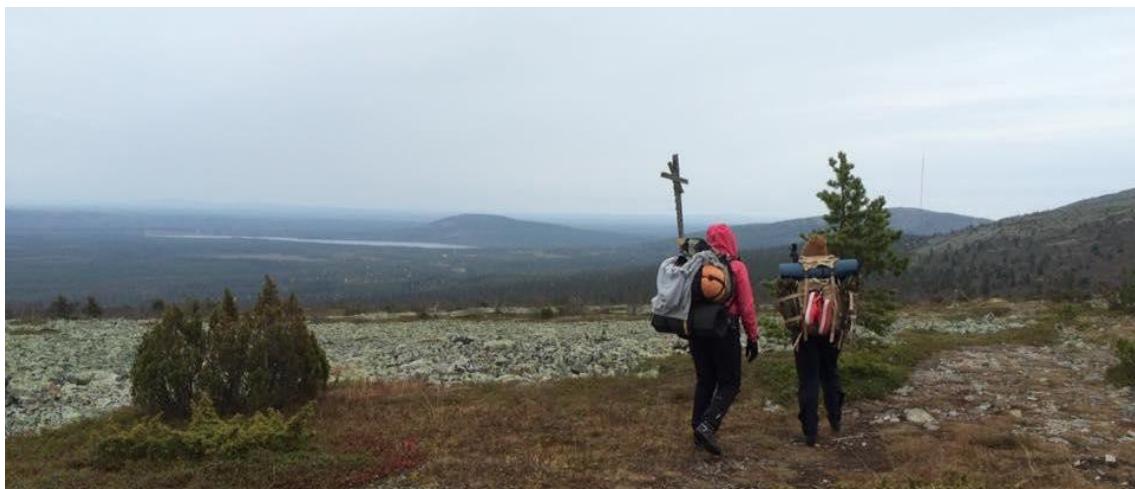


Figure 1. Hiking in the wilderness.

After the hike, in the post-phase, the experiences were reflected in the geography/biology and Finnish language lessons. The reflection was tutored by the two teachers. During the lessons, the students presented their photos and shared their experiences of given topics related to the learning goals. For research purposes, the students reflected their experiences in a digital photo diary, which included photos taken from their hike and written thoughts they had during the trip.

Data collection and analysis

Various kinds of qualitative data were gathered during the study. The data consist of unstructured teacher and student interviews, participant observation, audio-recorded field notes and students' digital diaries. The collected data are presented in detail in Table 1.

Table 1. Data sources.

| Type of data | Description | Amount of data |
|---|---|---|
| Interviews and audio-recorded field notes | Unstructured teacher and student interviews, discussions and observations | Total of 125 minutes of audio-recorded and transcribed material |
| Digital diaries | The students' reflections and photos | Total of 25 pages of written material |

The aim of collecting different types of data was to study both teachers' and students' agencies and pedagogical practices that enable and promote students' agency in the hiking course. First, unstructured interviews, discussions and observations provided essential information for analysis as well as overviews of all activities that occurred during the hike. The interviews with the two teachers while hiking delved into their practices in depth, discussed their views on outdoor learning, the meaning of nature and hiking for students' learning and the pedagogical issues in terms of the course. Informal student interviews considered students' thoughts, actions and feelings about the hike. The digital diaries supported the interviews and audio-recorded discussions along the way. Audio-recorded data covered the whole trip including interviews and discussions periodically from the beginning to the end of the hike.

The audio-recorded data were transcribed and all data were then analysed using qualitative content analysis methods (Schreier, 2012), conducted iteratively by the first and second authors. The analysis began with a data overview and the creation of a common understanding of the whole process. The data analysis proceeded as a series of cycles, during which questions were posed and the descriptions and representations of activities that reflected agency and agent

engagement were identified. As a unit of analysis, quotations, varying from one sentence to multi-paragraph excerpts, were used.

Results

Students' agentic engagement during the hike

The findings indicate that the students' emerging agentic engagement is evident through four aspects of agency: *responsibility*, *resilience*, *co-exploration* and *empowerment*. These aspects are presented here accordingly.

Responsible agency in this case refers to the students being responsible for their own and others' needs, learning and wellbeing (cf. Kangas et al., 2014). The students' agentic engagement emerged both as personal and shared responsibility that manifested in their behaviour, talk and written reflections. Students carried food and all camping equipment, such as tents and sleeping bags; they cooked and set up camp when arriving at a new location along the route. Shared accountability emerged as collective efforts and contributions, which became evident through reciprocal helping and equality. It further manifested as we-talk and togetherness; the groups regarded themselves like one unit of which the members were responsible not only for food and camping activities but also for learning, such as for navigating in a group on the right route. Specifically, the students hiked in small groups and they were allowed to hike the 35 kilometres at their own pace.

Physically, this is very heavy [. . .] But it is the point that all you need you carry by yourself. It is pretty awkward. And with these [. . .] you have to survive here.
(Teacher 1)

Before the hike, the students were taught some general principles in the classroom, such as how to survive in arctic circumstances; what to pack and how to prepare for changing weather conditions. The teachers also pointed out that the students must remember to take care of oneself and others during the hike. The following excerpt clarifies the responsible agency of the students. It also illuminates how the students positioned themselves as being responsible in setting the camp and taking care of themselves as well as the fireplace even though they were tired from hiking and the others could have a little fun near the camp area.

We all four were tired after walking and could not have done anything but we had to make a camp and set up a tent and make some food. Karhunjuomalampi was a much bigger campsite than the previous one. We went with Maria to the cottage to warm and we wanted to light a fireplace, but we did not have anything to do it with. The teacher helped us and then we stayed to keep an eye on the fireplace while the other groups climbed to the hill for the views. (Student 5)

Resiliency as an aspect of agentic engagement refers to 'sisu', a power that enables students to overcome challenging situations. Resiliency seemed to build on many different emotions and a strong will. Especially at the beginning of the hike, the students experienced hiking as too heavy and stressful but during the trip they seemed to be more engaged in the activities by expressing resiliency. The findings show that despite a variety of negative feelings and feelings of overwhelming obstacles, the students persistently continued with the trip and encouraged each other. Resiliency was also shared. Together they showed strong perseverance even though they got some injuries when wandering over the fells.

The first five kilometres were the worst. We stopped for the first time in the amethyst mine. [. . .] we continued the way to Pyhälampi where we did a lunch [. . .] The trip felt like never ending and we were near a nervous break. (Student 5)

We walked up a hill that felt never ending. Upon reaching the top, we encountered stunning views; the scenery was great. We went downhill swiftly, thinking it was half shorter than it really was. Downhill was just as painful. We almost got lost from the route, but eventually we realised that two different routes crossed after 100 meters. Eventually we got to the last campsite. (Student 2)

The third aspect is *co-explorative* agency, which refers to collaboration and collaborative exploration and problem-solving. Co-explorative agency is exercised in the learning situations where the students need each other for investigating, solving problems or experiencing. Many things related to practical skills, such as how to cook or where to get water on the way. In some cases, co-exploration related to exploring and observing nature. In co-explorative activities, the students shared their feelings, thoughts and ideas and tried to solve problems together. They were highly satisfied about discovering nature and surpassing challenges along the way. If they did not solve challenges by themselves they asked the teachers' help, from whom they received emotional and practical support. The following excerpt provides an example of the teacher's support after the efforts the students first made together. In the situation, two students try to light the camping stove during the first lunch break of the hike. They are hiking and using a portable stove for the first time, and are pretty excited about the situation.

Student 6: You did not get it?

Student 7: I cannot start it (fire). Oh, I am so scared about that fire.

Teacher 1: Try to light it here from the side. (demonstrates)

Student 7: Oh, this scares me a bit. (lights the stove)

Teacher 1: Do not, do not burn your fingers. Just like that.

Student 7: Do we have to put that stuff up?

Teacher 1: And now it is worth using those pliers, use these pliers when it's there [. . .] before you burn your finger.

Student 6: Those pliers should be used. (helping Student 7)

In the situation, the teacher positioned herself as a co-participant and let the students work as the primary agents and discover the practical solution. She also promoted the students to take charge of the task and encouraged them to manage the task by themselves. Later during the hike, the students lit the stove successfully and talked about cooking so they know what, when and how to cook food to sustain them to continue hiking. Lighting the stove was a bit challenging for other students as well at first, but both teachers advised all the groups and gave instructions for cooking during the first break. However, as the following teacher's quotations show, the students' agencies were highly respected.

The way we orchestrate the learning situations supports students' self-directed learning.

They are allowed to do and find out the ways to do things by themselves. (Teacher 2)

Let them experience, authentically. [. . .] It's the enrichment of this course that they can proceed freely, become a group and talk . . . (Teacher 2)

Furthermore, teacher 2 reflects: 'The trip will usually become such as . . . I mean that in fact they are the students who create the journey'. By this the teacher means that the things on which co-exploration and collaborative efforts focus, depends on the students and their competences as well as their self-efficacy beliefs, for example the things and challenges they meet are the essential things for them to learn, explore and experience.

The final aspect, *empowering* agency, shows that the students' agency emerged as shared feelings and developing a sense of competence and satisfaction upon achieving success. An important dimension of empowering agency relates to experiences of pure nature and the impressive landscape it provided. The students experienced the surrounding nature as arresting and some of the students felt their relationship with nature had changed. Even though the students found hiking with a heavy pack and a challenging route very stressful, interaction with nature and others produced a sense of power and positive feelings. One factor that had an influence of negative but empowering feelings was the cold. In the autumn, natural circumstances in the national park vary a lot; it is pretty warm in the daytime but the Celsius temperature can be below zero in the nights.

In a way, empowering agency can be seen to include other aspects of agency, that is, responsibility, persistence and co-exploration, because through these agentic engagements the empowering agency can be seen to build and rebuild. Although the students felt that the hike was hard and tiring, their reflections indicated high satisfaction with the experience: 'We all are so proud of ourselves!' (Student 3). Empowerment seems to relate especially to regarding their exposure to nature and the students' ability to surpass challenges along the way. Based on the findings, the existence of positive and negative feelings and increasing beliefs in their own abilities seem to be important in the way resiliency during the hike develops and is maintained.

The hike went well and it was in line with my expectations. Views were fancy. Mornings and evenings were cold. Otherwise, it was a successful trip. (Student 4)

Teachers' agency on a hiking course

In the light of existing research evidence, teachers' agency can be regarded through three dimensions: iterative, projective and practical evaluative (Biesta, Priestley & Robinson, 2015; Emirbayer & Mische, 1998). The analysis was theory-driven and the results of how teachers' agency emerged through these dimensions during a three-day hiking trip are presented here accordingly.

The iterative agency in this case meant evoking past experiences of organising such hiking trips. Teachers reported designing the course as a three-phased process, which they had experienced as a workable method also in their other courses. The phases included: 1) preparing (orientation), 2) hiking (hiking activities) and 3) reflecting (elaboration). Even though the participating teachers had organised such a hiking course several times before and are experienced in taking care of everything related to it, acting iteratively in this case means also acknowledging that each hiking trip is always unique and new. Teachers seem to have adopted the idea that their agency is relational; it is defined in relation to the students participating it and teachers consider it important to start fresh every time.

Even though I have done this many times, it is always new. It is sort of a life as a miniature. You get to the finish and experience all the misfortunes and difficulties along the way. (Teacher 1)

This turns out to be what the students make of it. (Teacher 2)

The practical–evaluative agency implies being closely engaged with the present (Biesta et al., 2015; Emirbayer & Mische, 1998). In this case, it meant quite simply being strongly present at any given moment. What happens during the hike cannot be designed or planned in detail; it seems that the teachers consciously let the hike and all the things encountered during it take their course. Pedagogically this approach seems to reflect the place-responsive pedagogy of Mannion et al. (2013) by emphasising flexibility, contingency and open-endedness. In its un-foreseeability, teachers regard the hiking trip as a 'school-time-altering' moment for the students and the teachers want first and foremost to foster this possibility to build and promote students' agency. In a way, it seems that the teachers need to have pedagogical courage to carry out a hiking trip with their students, daring not to orchestrate it in detail and to expose teenagers to an experience that ultimately requires *sisu* and persistence, both of which potentially foster building students' agency.

The time stands still here, sort of. I think this [hiking trip] is about growing as a person, gaining nature experiences, working as a group, improving self-knowledge [. . .] taking care of others and all this, real-life stuff. (Teacher 2)

As participating in the hiking trip is voluntary for the students, teachers regard them as their peers. Students are free to experience the hiking trip as a team without strict rules or supervision. The teachers are there for the students, present and available. This seems to blot out the pupil–teacher relationship and promotes teachers to get to know their pupils better as nature as an environment brings out the more versatile sides of their personalities.

Before we departed, one mother sent me a message that her son would sleep in the same tent with some girls and that it would be ok for her and the girls. I told her that I couldn't care less where he sleeps as long as he sleeps. (Teacher 1)

Actually there is no teacher–student relationship here, but we are here together experiencing this trip. (Teacher 2)

You actually get to know the students who attended this hiking trip in a completely different way than in a classroom ever. There are those, who are absolute rascals at school, but fantastic here. [. . .] The students seem to understand that the teacher is there in the same position as they are, she walks just like they do. This takes away the classroom authority from us at once. (Teacher 1)

The projective agency means orientations towards the future (Biesta et al., 2015; Emirbayer & Mische, 1998). Teachers regard it as important to reflect the hiking experience afterwards with their students, usually a few days after arriving back home. Considered particularly important are the reflections on the students' emotional level and taking a holistic view of the whole hiking trip to promote students' resilience. This has been acknowledged also in previous studies (e.g. Yeager & Dweck, 2012).

The meaning of these hiking trips is enormous afterwards. (Teacher 2)

[. . .] what was the best and what the worst. Even though someone thinks that the whole trip was just awful and how exhausting it was, when they start to think what was the best they see that there are so many sides. I usually ask what they thought or discussed with their friends . . . It raises a lot of themes. (Teacher 1)

Pedagogically, the teachers see vast potential in such hiking courses in the future and actively elaborated on some development ideas during the hike. According to the teachers, the yearly hiking course could serve as a platform not only for environmental subjects, but for interweaving several school subjects together. This would promote professional collaboration between teachers and the execution of the new core curriculum (FNBE, 2014).

I have been thinking about collecting some things or data that could be utilised in some other courses also. (Teacher 1)

This [hiking course] is related to physical education for sure. Then there are the arts and Finnish language, depending on what we do here. [. . .] And biology,

*geography, history and also domestic science as the groups cook for themselves.
(Teacher 2)*

Previous studies (Fägerstam, 2014; Glackin, 2016) have reported that teaching outdoors can appear challenging and difficult for teachers. Also in this study, the teachers estimated that there would be only a few teachers at their school, who would be interested or willing to arrange such a wilderness hiking trip with a class, which has an impact on the course development and future implementations.

I don't think that there are many [teachers] at our school who would want something like this anyway. (Teacher 1)

Even though the three dimensions of teachers' agency are presented here in a somewhat structural manner, the actual realisation of these dimensions is not as structured. Both Biesta et al. (2015) and Emirbayer and Mische (1998) see teachers' agency more as an interplay among these dimensions, which became evident also in this study. Past experiences, future orientations and being present are intertwined during the hiking course, which starts a few weeks before the three-day hike and lasts a few weeks afterwards. Teachers' agency and agentic behaviour are related and relational phenomena. Teachers' agency is related to students' agency and agentic behaviour and these are realised only through mutual interplay. This manifests in learning situations where the teacher positions herself as a co-participant and lets the students take their time and work as primary agents for discovering the practical solutions together.

The teachers and I are the last to arrive to the encampment. Students have already settled in the forest nearby and begun to prepare for cooking. Teacher 1 says, "OK, so everyone has found their way here and you have already made camp-fire too". One of the students asks, "How long a break are we having?" The teacher responds, "As long as you need". Teacher 2 starts to guide a group of few students in using a camping stove. "You have to separate these, let me show you." [...] The students start preparing their meals; they seem to be slightly uncertain how to use the equipment. Teacher 2 walks around and helps the students to get started. (A quote from the field notes)

Discussion and Conclusion

The aim of the study was to explore how nature-based outdoor learning, specifically a hiking course carried out in the Finnish arctic wilderness, could enable students to exercise and develop their agency. Secondly, we aimed to reveal how teacher agency emerges during the hiking course. The main results show that nature and outdoor learning can serve as a context for developing

agency, and essential competencies, especially in situations in which teachers' pedagogical thinking allows students the space needed to develop agency and autonomy.

The findings give evidence that outdoor learning in the arctic wilderness requires different aspects of agency from students and teachers. The teachers are experienced in camping and hiking, as well as orchestrating demanding nature trips to the wilderness. Iterative, practical–evaluative and projective agency were evident in the teachers' pedagogical solutions whereas responsible, resilient, co-explorative and empowering agency were most typical in students' behaviour. However, as the results show, the agencies of the teachers and the students are built on interaction and so are intertwined. Thus, the findings indicate that agency is socially shared (Engeström, 1999) and not only shared between the students (e.g. Kangas et al., 2014) but also between students and teachers. The teachers' assertion that it is the students who create the journey well illuminates their social-local-based pedagogical thinking and student-centred approach.

In terms of phenomenon-based learning goals, clearly defined content-oriented learning goals were not a target. Instead, the teachers aimed to promote generic skill development, students' sense of agency and self-directed learning that was guided by their own interests and the experiences they perceived as meaningful during the hike in authentic settings (c.f. Glackin, 2016). Responsibility and self-directed learning became evident in many situations during the hike. In their reflections, the students talked a lot about cooking; what and how they cook, how they set a camp and set up a tent, and how they plan to do all of this together in the group. The students were given agency and they were trusted. In a pedagogical sense, the preparation phase, for instance, could be seen as a trigger for adopting the position of responsible agency for the trip even though we can assume that the students were well motivated for the trip because it was optional.

From the pedagogical point of view, it seems that the teachers' example as experienced hikers was a one of the key elements in their outdoor learning pedagogy. They were brave and good examples, and therefore the students were brave and experienced the hiking in a wilderness as empowering and enjoyed success. The results support the ultimate goal of the course. As the teachers reflect: 'Thinking that the point of the whole case is [. . .] growing as a human being, having nature experiences, and then it is acting together with this group, and learning about yourself' (Teacher 2) '[...] and helping others' (Teacher 1).

The students' agency work refers to developing competencies and self-efficacy beliefs that are key for emerging agentic engagement. The teachers always guided and provided support when needed, and the students acted authoritatively and self-directed in their learning. From the viewpoint of socio–contextual factors and an emergent mutual responsibility, the teachers also regarded it as important that the students learn about and from each other, i.e. develop transversal competences for communicating and interacting with others. In the written guidelines for the trip, the teachers emphasised that it is essential to learn that others might have different skills, interests

and habits that should be respected in the group. In addition, the teachers emphasised that students must have opportunities to learn and experience in natural settings.

You see, there are students, who do not know many of the others and then they find their way to others. Teaching-wise this scenery raises questions of why things are the way they are here, why that rock looks that way . . . This makes learning . . . you can never learn these things from books. Here [in nature], the will to learn comes naturally. (Teacher 1)

In the classroom, a student's role is conventionally to practice and repeat procedures that the teacher demonstrates; the teacher holds power and determines what is correct and acceptable (Boaler & Greeno, 2000; Gresalfi et al., 2009). In outdoor learning settings, students have more opportunities to position themselves in agentive roles and exercise proactive agency, often due to changes in the teacher's role (Kangas, Kopisto, Löfman, Salo & Krokfors, 2017). The present study supports recent research findings (e.g. Becker, Lauterbach, Spengler, Dettweiler & Mess, 2017; Mackenzie, Son & Eitel, 2018) about the benefits of outdoor learning. It also provides evidence about a new kind of agency work that can be seen to relate especially to multiday outdoor learning experiences.

However, like all studies, this one has some limitations. First, data are somewhat limited. For instance, student interviews after the hike would have given more in-depth information about the students' thoughts and feelings regarding the course. Second, the course's optionality might have some critical effects on the results; emerging aspects of agency might be different if the course was mandatory. However, the results of this case study 'as a force of example' can be generalised to similar contexts when following our example, which is carefully chosen and systematically explored (see, Bennet & Elman, 2006; Flyvbjerg, 2006, 228). The question of subjective bias is important (Flyvbjerg, 2006), because critical views claim that a case study allows room for the researchers' subjective judgements. However, triangulation of the three researchers provides rigorous judgements. Two of the three researchers could provide an objective viewpoint for the data analysis and interpretations. In addition to the researcher and data triangulation, authentic observation and interviews during the course can be seen to increase the validity of the study. In addition, the results of the study were validated by one of the teachers who read the research manuscript and confirmed the interpretations.

One potential future topic concerns the ways phenomenon-based outdoor learning can be assessed if the learning goals are defined in more subject-specific ways, or how digital technology can be harnessed to support agency work in outdoor learning practices. The results are helpful in developing teacher education so that the ability to integrate teaching and learning processes with nature and other outdoor learning environments in pedagogically sound ways could, in future, become an integral part of the repertoire of teachers' professional knowledge and skills.

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