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'Wow! is that a birch leaf? In the picture it looked totally different': a pragmatist perspective on deep learning in Norwegian 'uteskole'

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ABSTRACT

This study investigates pupils' experiences with learning outside the classroom and discusses how these experiences might contribute to 'deep learning' according to a pragmatist theoretical framework and a situated perspective on knowledge. The data comprise materials from three months of fieldwork with participatory observations and qualitative interviews of pupils from two Norwegian primary schools. The results are interpreted according to John Dewey's two criteria for educative experiences, 'transaction' and 'continuity', and to our operationalisation of deep learning. We argue that learning activities that entail both transaction and continuity can be regarded as facilitating deep learning.

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Introduction

The aim of this study is to investigate pupils' experiences with learning outside the classroom and whether these experiences may contribute to deep learning. According to Jordet (2010), 'uteskole' [outdoor school] is defined as regular classes that are held outside school buildings on a weekly or biweekly basis in the nearby environment, the school grounds, nature and green spaces, and places of culture in the community. The teachers choose locations for uteskole that they consider suitable for supporting or strengthening the pupils' understanding of a given subject and bring their classes to these locations regularly. A grassroots movement of primary school teachers in Scandinavian countries has integrated uteskole as part of their teaching method on a weekly basis, and according to Barfod et al. (2016), eighteen percent of all Danish schools have one or more classes practising uteskole. The teaching method has been described as initiating inquiry-based, problem-solving activities and explorative and practical approaches and is mainly used in primary school. A central idea of uteskole is to integrate curricular content that, depending on age and stage, is traditionally taught in separate subject areas (e.g. geography, literature, ecology and history) in an integrated fashion both indoors and outdoors.

Uteskole is part of the field of experiential education, more specifically, the subfield of place-based education, which entails curriculum-based programmes where part of the education is moved outside school buildings (Roberts 2012, 8). The subfields of experiential education have their own histories and approaches, but they all draw from the same progressive intellectual taproot, the belief in 'the educative power of experience, of direct contact'. One of the strongest

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theoretical currents influencing experiential education is pragmatism, and the didactic model of *uteskole* is based on the pragmatist philosopher John Dewey's notions of experience and learning (Jordet 2010).

In the past ten years, 'deep learning' has emerged as a key term in educational policy and curriculum reform both internationally (Dumont, Instance, and Benavides 2010; Pellegrino and Hilton 2012) and domestically (The Norwegian Directorate for Education and Training 2020). Recently, our mapping review of research on deep learning in primary and secondary education from 1970 to 2018 identified two main conceptualisations: 'meaningful learning' and 'transfer of learning' (Winje and Løndal 2020, 38). Meaningful learning is conceptualised as an approach that pupils take to learning with 'the intentions to understand the *meaning* of the learning material and to *relate* new ideas to previous knowledge, driven by an *intrinsic motivation* to learn', while transfer of learning is conceptualised as pupils' 'ability to *transfer skills and knowledge* to a novel context'. Since the 1970s, these conceptualisations of deep learning have mainly been used to describe learning processes investigated through a cognitive theoretical framework. The increased emphasis on deep learning as a central element of educational policy formation and curriculum reform has led Tochon (2010) and Dahl and Østern (2019) to highlight the need for studies on deep learning that apply a broader theoretical framework, including embodied, social, emotional and cognitive aspects of learning. According to Biesta and Burbules (2003), pragmatist philosophy emerged as a radical critique of the Cartesian philosophical framework with dichotomies between mental and physical and between subject and object; consequently, pragmatist educational theories emphasise a more holistic understanding of learning. One way to incorporate these aspects into a more nuanced understanding of deep learning may be through a theoretical framework based on pragmatist educational theories.

We have not been able to identify any studies on *uteskole* that investigate deep learning, but some studies in outdoor education focus on 'meaning' (Ord and Leather 2011) and 'transfer' (Brown 2010). In the present study, we first elaborate how deep learning can be understood according to pragmatist philosophy and a situated perspective on knowledge based on previous research on outdoor education. Second, this framework is used to analyse and discuss pupils' experiences with regular *uteskole*. The research question guiding this study is 'How do primary school pupils experience regular *uteskole*, and how is deep learning reflected in these experiences?'

Theoretical framework

We first describe Dewey's two criteria for educative experiences, which are central to understanding how we make meaning of our experiences and how they are utilised as the basis for the didactic model of *uteskole*. We describe how Ord and Leather's (2011) elaboration of Dewey's notion of meaning-making and Brown's (2010) argument for a move from 'transfer' to 'generality of knowing' can aid our attempts to define 'deep learning' and operationalise the concept using Nicol's (2003) multimodal 'model of knowing'.

Dewey's criteria for educative experiences – transaction and continuity

Dewey (1938) highlights two criteria for educative experiences, transaction and continuity. Every experience entails a transaction between an individual and the environment and entails continuity, impacting previous, current and future experiences. Before the late nineteenth century, children mainly learned the skills and knowledge needed to contribute to society through participation in everyday work (Osberg, Biesta, and Cilliers 2008). The establishment of traditional schooling led to the creation of a separate educational world for children, the classroom, where the world outside school was represented as a second-order expression of reality, mainly through letters, symbols, books, pictures, and, in more modern times, computerised digital representations. Subsequently,

in traditional schooling, pupils mainly transact with these representations, and continuity is established by connecting the pupil's own experiences to these representations.

The fundamental idea in *uteskole* is that pupils transact with the world outside the classroom together with their classmates (Jordet 2010). Continuity is established between indoor and outdoor learning activities and between pupils' individual and collective experiences. *Uteskole* is a didactic method designed to integrate well with curriculum-based programmes. This is different from many outdoor education programmes that emphasise developing participants' 'character traits' (Brookes 2003). However, the focus on meaning and transfer in outdoor education research suggests that there might be fruitful theoretical contributions that can aid our investigation of deep learning in *uteskole*.

Meaning

According to Biesta and Burbules (2003), central pragmatist thinkers such as Charles Sanders Peirce and John Dewey emphasise that to attribute meaning to concepts, the individual must be able to apply them to existence and experience the consequences. This transaction between the individual and the environment is the basis for the meaning-making process. Ord and Leather (2011) elaborate on Dewey's notion of transaction in supporting participants' meaning-making efforts regarding their experiences in outdoor education. Every transaction entail 'trying' and 'undergoing', referring to the individuals' actions to manifest themselves upon the environment, and vice versa. Ord and Leather highlight that the environment manifests itself upon the individual mainly as a reconceptualisation or change in how the individual sees the environment, rather than an actual physical change, and note that constant reorganisation and restructuring are fundamental to Dewey's notion of an educative experience. According to Ord and Leather (2011), Dewey's notion of continuity is also central in this meaning-making process, both the participants' prior experiences and their understanding of how prior and current experiences might impact future experiences.

Biesta and Burbules (2003) suggest that Dewey's theory of experience as transaction can be developed into a 'transactional epistemology', where knowledge is grounded in the transaction between the individual and the environment. Elsewhere, we have suggested that this transactional epistemology can be operationalised in an education setting through Nicol's multimodal model of knowing (Winje and Løndal 2021).

Transfer

Roberts (2012) highlights that to pragmatists, problem solving is inherently contextual, entailing that universal rules simply do not work. Because, according to pragmatist philosophy, there is no fixed truth, we are likely to be wrong when we attempt to find the best course of action, and these errors are part of learning. Thus, we can only have partial knowledge, and what we know is constantly being revised. This contextualised form of reason, which Roberts describes as 'anti-foundationalism', indicates that correct courses of action are discovered through experimentation in unique times and unique places. As Dewey (1938, 47) explains, 'it is a mistake to suppose that acquisition of skills in reading and figuring will automatically constitute preparation for their right and effective use under conditions very unlike those in which they were acquired'. Brown (2010, 17) makes a similar argument in criticising the traditional cognitive perspective of transfer, where knowledge is regarded as a substance or package that can be moved between various contexts. This notion of transfer is also found in the field of outdoor adventure education, where outdoor experiences are supposed to influence participants' daily lives after they are finished with the programme. Brown notes that problem solving and human cognitive practices are not simply internalised mental processes; they are always performed in conjunction with the setting. He argues that instead of applying a cognitivist perspective, participants' experiences in outdoor education should be regarded from a situated perspective as different ways of 'knowing', referring to 'regular patterns

in someone's participation in interactions with other people and with material and representational systems'. The emphasis should rather be on assisting learners in becoming effective participants in a range of situations. As we read it, Brown's argument suggests that in educational settings, pupils should be given the opportunity to experience and transact in a range of situations, both indoors and outdoors.

A multimodal model of 'knowing' as an operationalisation of deep learning

Nicol (2003) provides an alternative framework for epistemological diversity that may include both a pragmatist understanding of meaning and an alternative situated perspective of transfer in a coherent model that offers an opportunity to operationalise deep learning in line with pragmatist philosophy and a situated perspective on knowledge. He distinguishes among experiential, presentational, propositional and practical ways of knowing. Experiential knowing is knowing through direct first-hand experience of a person, place or thing. Presentational knowing is manifest in images that articulate experiential knowing, for example, art, music, dance, poetry and drama. Propositional knowing is knowing 'about' something in intellectual terms of ideas and theories and expressed in abstract language or mathematics. Finally, practical knowing involves how to do something, expressed as a skill, knack or competence. This model incorporates both transaction and continuity and could be a useful tool for analysing pupils' experiences with different learning activities in *uteskole* through the four ways of knowing.

Ord and Leather (2011) suggest that to extract meaning from experiences, there needs to be an emphasis on both transaction and continuity, while Brown (2010) suggests a move from transfer to 'generality of knowing' to assist learners in becoming effective participants in a range of situations. Accordingly, in a pragmatist understanding of deep learning, pupils are given the opportunity to experience and transact in learning processes in a range of situations that incorporate experiential, presentational, propositional and practical knowing.

In this article, we utilise Dewey's criteria for educative experiences, namely, transaction and continuity, to establish whether pupils experience learning activities that are in line with the didactic method of *uteskole*, and we utilise Nicol's model to investigate whether pupils' self-reported experiences and our observation of learning activities indicate important aspects of deep learning.

Materials and methods

This study is part of a project investigating teachers' and pupils' experiences with weekly *uteskole* in two schools in Norway. A previous article focuses on teachers' experiences with *uteskole* (Winje and Løndal 2021), and the present article focuses on pupils' experiences. We explore their experiences through a qualitative life-world approach (Bengtsson 2006) consisting of three months of fieldwork with participatory observations and subsequent qualitative research interviews.

Sample

The lack of a systematic mapping of the use of *uteskole* as a didactic method in Norway led us to use snowball sampling (Cohen and Arieli 2011) in our network to identify schools with regular *uteskole* programmes. An overview of schools in eastern Norway practising *uteskole* was developed, and we included two schools that highlighted and promoted a weekly *uteskole* programme and had been practising *uteskole* regularly for more than 10 years.

School 1 is a primary school with 400 pupils between 6 and 13 years of age situated in a suburban neighbourhood near a forest. In this school, only the first and second grades have *uteskole* weekly, and we include the pupils in the second grade and the two teachers who always participated in *uteskole*. Each grade has two classes, each consisting of 20–25 pupils. The present study sample from school 1 comprises pupils in second grade and two of their teachers. School 2 is a primary and

lower secondary school with 600 pupils between 6 and 16 years of age situated in a suburban area. Each grade has two classes consisting of approximately 25 pupils. The present study sample from school 2 comprises pupils in 5th to 7th grades and three of their teachers.

Data collection

The fieldwork was conducted by the first author during the autumn of 2018 and included 15 days of participatory observation. Preliminary visits to one *uteskole* day at each of the two schools supported the development and refinement of the structure and themes of an observation guide, as recommended by Brinkmann and Kvale (2015).

The pupils at school 1 were observed for six whole days consisting of related outdoor and classroom sessions. The pupils at school 2 were observed for six whole days outdoors (4–5 h each) and three short days indoors (1 h each) with related classroom activities. As suggested by Merriam (2009), the pupils were followed in their regular routines, and field notes were taken about their activities and locations visited, along with information gathered through walk-along interviews and conversations with the pupils. The field notes were structured and rewritten into complete text files by the first author within two days. Ten pupils, four from school 1 and six from school 2, were individually interviewed at the end of the observation period, and these interviews were conducted in a room next to their regular classroom to make the pupils more comfortable. The pupils are given aliases that accurately represent their genders, and their school affiliation is denoted by adding S1 or S2. Anna, Michael, Francisca and Richard are second graders from school 1, while the fifth graders Clara and Thomas, the sixth graders Elisabeth and Albert, and the seventh graders Xavier and Judy are from school 2. The interviews were audio-recorded and lasted between 20 and 35 min. As recommended by Brinkmann and Kvale (2015), the semi structured interview guide with open-ended and explorative questions was tested through a pilot interview with a colleague who has extensive experience with *uteskole*.

Transcription and analysis

The interviews were transcribed verbatim by a professional transcriber and, as recommended by Brinkmann and Kvale (2015), checked against the audio file by the first author to ensure that the meaning had been captured. All the extracts from the interviews are reproduced in the first author's translation with an attempt to be as faithful as possible to the spoken language.

Braun, Clarke, and Weate's (2016) six-step model of thematic analyses provided the framework and structure for the present analyses of pupils' experiences with *uteskole*. In step one, material collected from observations and interviews was read repeatedly to develop an overview. In the second step, codes were developed to clarify and organise the material. In steps 3–5, the codes were merged, improved and developed into specific themes. In the sixth step, the findings were structured and the current paper written. As highlighted by Braun, Clarke, and Weate (2016), this is a dynamic analytic process, and the analyses are continuously affected by the researcher's active choices. In this study, the inductive interpretation of the themes identified is strongly linked to the data themselves, while theoretical interpretations are supported by relevant theory (Braun and Clarke 2006). As suggested by Braun, Clarke, and Weate (2016), the analyses first relied on inductive interpretations to establish specific themes, and second, theoretical interpretations based on our operationalisation of deep learning were used to highlight, support and elaborate the inductive interpretations.

Trustworthiness

In line with Merriam (2009), we have attempted to provide transparent descriptions of all the phases of the research process and link them to theories, methods, and concepts used in previous studies of

uteskole. Although only the first author conducted the fieldwork, both authors actively participated in the analyses and emphasised identifying and including phenomena and interpretations that did not conform to expectations (Johnson 1997).

Ethical considerations

The teachers, pupils and pupils' guardians gave their informed consent to participate after receiving oral or written information about the project, the possible consequences of participating, and their right to withdraw at any time during data collection (Brinkmann and Kvale 2015). As directed by Backe-Hansen and Frønes (2012), the first author always asked the pupils for permission before following them during observation. To ensure confidentiality, all the informants are given aliases, and no identifying characteristics are reported. The Norwegian Centre for Research Data approved our efforts to protect the participants' privacy in this project (Project Number 60432).

Results

When presenting the results, we refer to situations that describe the totality of the material. Commonalities are emphasised, but more particular aspects may also be highlighted. Two central themes emerged in our analyses of the data on the pupils' experiences with uteskole. The first theme, *movement in and across varied terrain*, highlights the pupils' experiences moving in a variety of contexts, on their way to and from and at the locations. The second theme, *organised outdoor learning activities*, represents the pupils' experiences with the learning activities organised by the teachers at the uteskole location.

Movement in and across varied terrain

Both schools alternate among different uteskole locations, and they mainly travel to these locations by walking and/or cycling through varied surroundings of suburban neighbourhoods, gravel roads and forested paths. The uteskole locations are generally forested, semi-open areas, where it is permitted to light bonfires. Transport to the uteskole location is organised similarly in the two schools, with one teacher in front of the group and one teacher in the back, approximately 50–100 metres apart from each other. The pupils are free to move as they like as long as they stay between the two teachers.

Younger pupils – exploring and playing

The field notes from school 1 describe how the second graders behave in uteskole on the first day of snow:

We are walking on a gravel path through a forested area. Suddenly, three pupils break out of the main group and head to a clearing next to the path. They lie down and start making snow angels by 'windmilling' with their arms and legs. Two other boys are falling a bit behind because they make snowballs and put them into an empty shopping bag. After a little while I notice a girl in waterproof overalls diverging from the gravel path and into a small creek next to the path, and after a moment's consideration, she steps into the creek and starts wading. It does not take long until she has water above her thighs. A teacher notices, and after watching the pupil for a little while tells her to climb out. The pupil protests but does as she is told and returns to the gravel path.

The transportation phase provides opportunities for pupils to engage with nature and to explore different ways of moving in and interacting with their surroundings. This freedom to move is an important aspect of the pupils' experience, and when asked what she prefers, indoors or outdoors, Francisca (S1) gives a typical description, exclaiming 'Outside! Because then I am free to move'.

Second grader Michael (S1) describes how the younger pupils behave in their free time at the uteskole location: 'We were in the big forest, and first we built a small cabin and then we played

that we could only step on rocks'. The second graders from school 1 use this free time mainly to continue playing and try out different ways of moving in and interacting with their surroundings. On several occasions, we observed pupils making 'camouflage' by smearing charcoal or blueberries on their face. Now and then, some of the pupils climbed so high in trees that they needed help from their teachers to get back down.

Older pupils – functional and adaptable activities

In general, the younger pupils in school 1 have easier routes to their locations than the older pupils in school 2. The field notes from the observations describe one route that the fifth, sixth and seventh graders must take to reach one of their *uteskole* locations:

The pupils spend about an hour getting from their school to the *uteskole* location. They cycle through a residential neighbourhood, manoeuvre on bike-paths along lightly trafficked roads, before crossing a bridge over a highway, then through a forested area on gravel roads, before they park their bikes and start on their final hurdle, a steep climb up a forested hillside where they must hold on to branches, roots and rocks, sometimes even crawling on all fours, to get to the *uteskole* location.

The pupils in this school gain experience with moving in more demanding surroundings and the added difficulty of manoeuvring their bicycles. These pupils adapt their movements to the surfaces they are moving across, the traffic and the physical strain of cycling and climbing uphill. The pupils generally seem to enjoy these movement challenges, but some are clearly ambivalent about the situation, as the field notes describe:

Soon after the pupils start cycling again, they encounter a challenging obstacle. It is a steep slope on an uneven, loose gravel path, speckled with large, slippery rocks. All the pupils ride down both obstacles without falling off their bikes, although some of them are clearly not in control of their bikes. During the descent and after, I hear one of the pupils' shout 'that was awesome' while another yells 'oh my God, that was scary'.

It seems that the movements required by the pupils to reach the *uteskole* locations are sometimes too demanding for their present competence. Seventh grader Xavier (S2) underlines that *uteskole* can be quite physically demanding: 'You get quite exhausted from it. It can be tough, physically, having to walk and cycle for such a long time'.

The pupils in both schools are given some free time to play, explore or rest during their stay at the *uteskole* location. Fifth grader Clara (S2) and seventh grader Judy (S2) provide answers typical of the older pupils regarding what they do in the free time at their *uteskole* location: 'It is not like we play family and stuff like that. Usually, we sit around a bonfire, talking and eating, but you are of course free to do whatever you want' (Clara); 'I usually sit around with my friends and talk, and perhaps spend a bit longer than normal eating lunch' (Judy). Older pupils prefer to relax, eat and talk around the bonfire in their free time.

Organised outdoor learning activities

The pupils provide some examples of how the learning content from the classroom is integrated into *uteskole*, but many of the learning activities organised outdoors are nearly identical to typical indoor learning activities.

Connecting indoor and outdoor activities

There does not seem to be a set starting point in the sense that the subject area is always introduced indoors first and then outdoors. Sometimes the outdoor experiences function as the catalyst for the introduction of new learning content, while at other times, theoretical aspects provide the starting point. The pupils express that *uteskole* provides opportunities to experience the things they learn about in the classroom, and fifth grader Clara (S2) provides a common description:

When we are outdoors, we can see how things are in real life. It is harder to learn about leaves when you are indoors than when you are outdoors. When you are outdoors you can just find them in the forest, and in pictures they do not always look the same as in real life. You find a birch leaf in the forest and think to yourself: 'Wow! Is that a birch leaf? In the picture it looked totally different'.

The pupils highlight that seeing something in a book is not the same as experiencing that object in an authentic environment. Second grader Anna (S1) makes a similar distinction: 'We learn about birds. They (the teachers) tell us what they are called and what they look like, and then we try to find them, and then we learn what they look like and how we can find them'. She distinguishes between the teachers 'telling' her what a bird is called and looks like and 'learning' it by experiencing the bird herself and preparing food for nonmigrating birds and placing it in the trees.

Seventh grader Xavier (S2) notes another advantage of being in objects' natural habitat:

Me and a friend were looking for branches for the bonfire, and then we suddenly saw three hares running after each other. We had never seen that before. The difference is that indoors you might see something new on a piece of paper, for example when you learn something in languages, but it is not memorable. It is not something you remember, like seeing three hares running after each other. You don't see that every day.

The pupils regard *uteskole* as a learning context where it is possible to connect their theoretical knowledge to what they call 'the real life' outdoors and express that experiencing objects first-hand in their natural surroundings helps their learning process because they are more memorable.

There is a difference between the experiences of the pupils in school 1 and school 2 regarding how the teachers facilitate a connection between what they do indoors and outdoors. In school 1, the teachers give the pupils tasks when they return to the classroom where they reflect on what they experienced outdoors and write and draw in a designated '*uteskole book*'. As Anna (S1) explains, 'We write what we have done outside, and then we draw what we have done, and then we write what we have learned'. A significant part of the *uteskole* day in school 1 is reserved to process the experiences through writing and drawing. In school 2, the teachers dedicate one class every third week to reflecting on previous experiences of being outdoors, providing suggestions for preparing skis or bicycles, discussing possible routes to the *uteskole* location, and talking about what to wear.

Establishing and maintaining campsites

On some occasions, the teachers in school 2 focus on developing the pupils' outdoor living skills. Seventh grader Judy (S2) notes that outdoor living activities involve gaining practical knowledge:

In the classroom we learn a lot of theory. Now and then, we also have one class where we learn about things connected to being outdoors. When we are outdoors, we practise actual practical stuff, for example, how to dress properly, how to use axes and knives. These are things you must do to learn. It is more fun because you can actually try it out in the real world.

Judy emphasises that they learn these outdoor living skills through practical and active participation in establishing and maintaining campsites.

In school 1, the teachers establish and maintain the campsite. Consequently, the younger pupils are mainly bystanders and avoid important aspects of outdoor living, such as chopping wood and lighting and putting out bonfires.

Outdoor classroom activities

The pupils highlight that many of the organised outdoor learning activities are very similar to indoor learning activities, such as solving math problems with pens and paper and answering quiz questions on a variety of school subjects. As second grader Michael (S1) describes, 'We had to move around in a circle, reading questions and answering them. 'What are the names of the Norwegian king and queen?', 'What is a seesaw?' and 'Which bird is this?' (picture presented). Six pairs of

pupils stood in a circle answering questions read from a laminated piece of paper. When asked if there is anything that she finds boring with *uteskole*, fifth grader Clara (S2) answers: ‘When we get a piece of paper and have to answer questions, that can be quite boring’.

Discussion

Two main categories of pupils’ individual experiences with *uteskole* emerge from our analyses: 1) *movement in and across varied terrain* and 2) *organised outdoor learning activities*. When we look at these results in relation to our research questions – *How do primary school pupils experience regular uteskole, and is deep learning reflected in these experiences?* – some interesting issues for discussion emerge. These issues are directly related to how different learning activities in *uteskole* are experienced by the pupils and how their experiences might be considered related to our operationalisation of deep learning. The issues address 1) learning activities that reflect transaction and continuity, 2) learning situations ‘in between’, and 3) learning activities based on manipulation of symbols and representations.

Learning activities that reflect transaction and continuity

Some of the organised learning activities reported by the pupils appear to be derived directly from curricular themes in school subjects. The most evident of these themes are related to the school subjects science and physical education, namely, biology and outdoor living. These two themes appear to be taught in a formal, integrated fashion, where the pupils work with the theoretical aspects indoors, while outdoors, the focus is on first-hand experience, practical knowledge and problem solving.

Dewey (1938, 43) states that ‘An experience is always what it is because of a transaction taking place between the individual and, what at the time, constitutes the environment’. A central aspect is teachers’ choice of context. An important feature of *uteskole* practice is that the location – that is, forested, semi-open areas – seems suitable for the subjects of biology and outdoor living. The location provides many opportunities for the pupils to transact with their surroundings in a way that is relevant to these subject themes, such as identifying trees, orienteering using maps, or managing bonfires to stay warm and cook their lunch. The Norwegian emphasis on outdoor living as described by Waite, Bølling, and Bentsen (2016) might play a part in teachers’ decisions to conduct *uteskole* at these locations. Another reason might be found in teacher education regarding *uteskole*, which is often connected to specialisation in physical education or science (Winje and Løndal 2021). Nevertheless, these learning activities in the two schools are examples of what Jordet (2010) describes as an operationalisation of Dewey’s (1938) educational criterion of *transaction* in *uteskole* practice.

There is a connection between learning activities outdoors and indoors in relation to biology and outdoor living. School 1 has a designated ‘*uteskole* book’, used to document pupils’ experiences outdoors when they return to the classroom. In school 2, the emphasis is on preparing the pupils for their trip outdoors the following week. These examples of connections between learning activities indoors and outdoors are in line with Jordet’s (2010) recommendations. He suggests that the establishment of such connections can be regarded as an operationalisation of Dewey’s (1938) criteria of continuity, where current experiences are processed and understood in light of previous experience and enhance the quality of future experiences.

The way *uteskole* is practised in relation to biology and outdoor living, with an emphasis on pupils having first-hand experiences outdoors and connecting these experiences with learning activities indoors, is in line with the didactic method of *uteskole* (Jordet 2010) and can also be regarded as an incorporation of Dewey’s (1938) two criteria for educative experiences, transaction and continuity in *uteskole* practice.

Deep learning in biology and outdoor living

An important contextual element of our study is its relevance to the recent curriculum reform implemented in Norwegian compulsory schools (The Norwegian Directorate for Education and Training 2020). A key ideological purpose of this reform is that the knowledge content and teaching methods of subjects should contribute to deep learning among pupils. Our mapping review of 50 years of research on *deep learning* in primary and secondary education identified ‘meaningful learning’ and ‘transfer of learning’ as the two main conceptualisations (Winje and Løndal 2020). In the present study, deep learning is operationalised through Nicol’s (2003) multimodal model of knowing, comprising experiential knowing, presentational knowing, propositional knowing and practical knowing.

Experiential knowing is knowing through direct face-to-face encounters with persons, places or objects, and our analyses revealed situations that stimulate the pupils’ experiential knowing related to biology and outdoor living, where the pupils are free to engage with their surroundings and transact with the forest using all their senses. Presentational knowing allows pupils to express their experiences, and our results show this in the use of the *uteskole* book in school 1 and the opportunities to collectively reflect on and share their experiences of outdoor living in school 2. Propositional knowing entails knowing about something through ideas and theories expressed in abstract language or mathematics and is apparent in the emphasis on learning about categories of birds (migrating/nonmigrating) and trees in school 1 and the focus on understanding maps, weather forecasts and which fabric to wear according to the forecast in school 2. Practical knowing means knowing how to do something, expressed as a skill, knack, or competence, and our study revealed practical tasks in school 1, where the pupils prepared bird food and identified trees using templates, and in school 2, in the opportunities to ride a bicycle, use maps and light bonfires. The identification of four ways of knowing in relation to these learning activities indicates that the pupils in these two schools experience learning activities that may facilitate deep learning regarding these two subject themes.

‘In-between’ activities

Informal learning situations occur during the transportation phase and in the pupils’ free time at the *uteskole* locations, where the pupils transact with their surroundings. For the pupils, it is central that they are free to move and act as they like, as described on the first day of snow, where they engage in ways of exploring and playing with the snow by making snow angels and snowballs and wading in the ice-crusted creek. An interesting aspect regarding these (movement) transactions is that they mainly occur between structured teacher-led activities. Similar findings are reported in Waite and Davis’s (2007) study on *forest schools* in England, which observes greater engagement of the pupils and rich learning opportunities during the free time *between* the formal learning activities. Sahrakhiz, Haring, and Witte (2018) describe similar learning opportunities in their study of German outdoor schools and call them ‘informal learning processes’.

The pupils in our study express that they appreciate the freedom and opportunities to explore and play with their classmates, and Bølling et al.’s (2019) findings also indicate an association between *uteskole* and psychosocial well-being. However, we find that teachers themselves rarely engage in establishing a connection between pupils’ movement experiences in between structured activities and the learning content, for example, curricular themes of physical education.

There seems to be a lack of focus from teachers on establishing continuity between informal and formal learning activities. The teachers adhere to what Roberts (2012) describes as the ‘romantic current’ of experiential education, facilitating situations for the pupils to freely experiment and experience different ways of moving without focusing on developing their experiences further in a curriculum-relevant direction (Winje and Løndal 2021).

One way of establishing a connection between the curriculum and pupils’ experiences might be by facilitating situations where pupils can reflect on their experiences. Drawing on

phenomenological and pragmatist philosophy, Standal (2016) describes how pupils' movement experiences provide potential for developing 'movement literacy', emphasising the subjective experience of being able to move and manoeuvre in the environment rather than acquiring a set of normative ideals for effective movement. He underlines that for these movement experiences to be enhanced and developed into movement literacy, there needs to be an element of reflection, where pupils become consciously aware of their experiences in such a way that they can revise and further develop them to enhance the quality of future experiences. This is not an attempt to argue that all free time should be eliminated from *uteskole* but instead a suggestion that teachers be conscious of the experiences that pupils are having 'in-between' as something that they can connect to the formal learning activities. The learning opportunities in these experiences are not limited to the development of movement, and it might be just as fruitful to establish connections between pupils' experiences in their free time in *uteskole* and the curriculum aims related to languages or mathematics. As Løndal (2010) describes, pupils certainly learn something from these informal experiences, but if they are not explicitly thematised by the teachers in formal learning activities, they cannot be regarded as educative, according to Dewey's notion of educative experiences.

Deep learning through informal movement

The pupils' first-hand experiences of movement in the transport phase and their free time at the *uteskole* locations can be considered examples of what Nicol (2003) describes as experiential knowing, and the movement competency and familiarity that they develop with the *uteskole* locations due to the regularity of experiences might be considered practical knowing. Although the pupils might share their movement experiences with their friends in an informal fashion, the teachers seldom facilitate situations, as Standal (2016) recommends, where the pupils can collectively express or share their experiences formally, as in presentational knowing. Nor do we find situations where the pupils take part in learning activities where their movement experiences are developed or supported by theoretical or abstract knowledge, as in propositional knowing.

Our findings indicate that there is considerably higher potential for developing pupils' movement experiences in *uteskole* in line with the curricular aims of deep learning (The Norwegian Directorate for Education and Training 2020). The pupils might learn movement due to experiential and practical elements, but there is unused potential for deep learning, which entails including presentational and propositional elements in a more organised and planned fashion. Our analyses reveal some instances where the teachers try to stimulate and support the pupils' movement capabilities, for example, encouraging them to try cycling rather than roll their bicycles down a slope, but we argue that there is a need to organise learning activities in *uteskole* to provide more opportunities for the teachers to support the pupils' development.

Learning activities based on manipulation of symbols and representations

Our study also reveals situations where pupils take part in learning activities that mainly entail manipulating symbols and representations. In contrast to the forest being a relevant context for facilitating first-hand experiences related to biology, outdoor living and movement, learning activities focusing on symbols and representations commonly lack a distinct connection to the context, for example, when pupils are tasked with solving rebuses and taking quizzes about Norwegian inventors or the royal family. These representational learning activities are not designed to facilitate transaction between the pupils and the context and seem to be regarded by the teachers as knowledge that can be learned regardless of context, similar to Brown's (2010) critique of a cognitive perspective on transfer of learning.

Furthermore, genuine continuity between indoor and outdoor learning is not established when the activities are essentially the same indoors and outdoors. According to Dewey (1938), a lack of emphasis on transaction between the pupil and their surroundings leads the experiences to become meaningless, and narrow continuity between indoor and outdoor learning activities

means that there is no actual integration between the two. Thus, these learning activities cannot be considered to adhere to the didactic method of *uteskole* as described by Jordet (2010).

Deep learning in learning activities focusing on representations

Looking at these learning activities in relation to our operationalisation of deep learning through Nicol's (2003) model of knowing, the following picture emerges: Since the focus is on representations, predominantly presented on pieces of paper, there are few relevant first-hand experiences with the surroundings found in these activities and, thus, little experiential knowing. Lacking focus on first-hand experiences, there is no reason for the pupils to express and share their experiences as in presentational knowing. The writing or drawing is mainly connected to the representational tasks, not to the surroundings or to their first-hand experiences of their environment. Since there is no emphasis on solving practical problems relating to the environment, there is no focus on practical knowing. The main emphasis is on using representations or manipulating symbols in abstract language, which is in line with propositional knowing. The pupils might learn to manipulate symbols and representations and communicate them to other pupils, but the potential for deep learning is lost if the teachers do not manage to include more experiential, presentational, and practical elements.

We argue that this finding might be due to how 'knowledge' is understood in traditional schooling. Osberg, Biesta, and Cilliers (2008) describe the different epistemologies affecting education and provide an interesting perspective regarding learning activities focusing on representations. They describe how school is established as an educational world for children, separate from what they call the 'real world', and consequently, the world must be represented through the learning material in the classroom, such as books, worksheets, films, videos, computers and tablets. Our study reveals that the representations are brought outside into the environment that they were originally meant to represent and made the focal point of many of the formal learning activities outdoors. Another issue is that the contexts chosen for *uteskole* seem more directly connected to biology and outdoor living, rather than languages or math. Schools may expand the use of several locations in *uteskole* and make teachers aware of the many possibilities inherent in the surroundings.

Concluding remarks

This study investigates pupils' self-reported experiences and our participatory observations of learning outside the classroom and discusses how these experiences might contribute to deep learning. Our results reveal two main themes: 1) movement in and across varied terrain and 2) organised learning activities outdoors. We have shown how learning activities emphasising biology and outdoor living can be regarded as adhering to the didactic method of *uteskole* as described by Jordet (2010). Furthermore, we argue that these learning activities can be regarded as facilitating deep learning due to the incorporation of experiential, presentational, propositional and practical knowing. When *uteskole* is conducted in line with Dewey's (1938) and Jordet's (2010) suggestions for transaction and continuity, it also seems to incorporate different ways of knowing, as described by Nicol (2003). Nicol's model of knowing incorporates emotional, social, embodied and cognitive aspects of learning, and by operationalising deep learning through this model, the approach is also a response to the critique of deep learning investigated mainly from cognitive perspectives. We argue that *uteskole* can be a fruitful method for facilitating deep learning from a pragmatist philosophical framework and a situated perspective on knowledge. However, in the two schools we investigated, we only found transaction and continuity and the four elements of knowing in learning activities regarding biology and outdoor living, which can be considered easy to relate to the *uteskole* locations chosen, namely, the forest. We argue that there is potential for facilitating deep learning in *uteskole*, but there should be an increased emphasis on establishing transaction and continuity and the incorporation of other subject themes by alternating between diverse contexts to allow for integration of a wider variety of subject themes. These findings should be considered when designing teacher education programmes focusing on *uteskole*. Furthermore, there is a

need for studies that investigate uteskole while critically applying the foundational pragmatist framework.

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