The grass *is* greener outdoors

Potentials for deep learning in Norwegian uteskole

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For Oliver,

Hoping that you will realise that the grass is greener outdoors

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Øystein

Summary English

The grass *is* greener outdoors - Potentials for deep learning in Norwegian *uteskole*

In this article-based thesis I investigate how deep learning is understood in educational research, and how *uteskole* [outdoor school] can be practised to facilitate deep learning processes.

These main research questions are operationalised into five research sub-questions:

1. How is deep learning conceptualised and defined in previous research on primary and secondary education?
2. How can the conceptualisations of deep learning be understood within an experiential education framework?
3. What are teachers' intentions in practising regular *uteskole*?
4. What activities and strategies do teachers utilise when practising *uteskole*?
5. How do primary school pupils experience regular *uteskole* and how is deep learning reflected in these experiences?

The ambition is firstly to gain an overview of how deep learning is conceptualised in previous research in primary and secondary education through a systematic mapping review of deep learning and adapt these concepts to an experiential education framework. Secondly, I explore teachers' intentions and practise and pupils' experiences of regular *uteskole* through a three-month fieldwork with participatory observation and qualitative interviews with teachers and pupils at two Norwegian primary schools. As a theoretical perspective I utilise an experiential education framework, based on John Dewey's educational philosophy, Arne Jordet's didactic model of *uteskole*, and Robbie Nicol's model of knowing, in the analyses of this empirical material.

In article 1 we find that there are two main conceptualisations of deep learning defined in previous research in primary and secondary education: *meaningful learning* and *transfer of learning*, and that both concepts focus on cognitive aspects of learning. Furthermore, we find that deep learning has been investigated worldwide, in the school subjects of languages, mathematics and science, often in combination, and with informants in the age range of 13-16 years. We argue that the emphasis on cognitive aspects is not sufficient if it is going to account for pupils learning in all subjects and learning contexts in primary and secondary education and suggest that future studies of deep learning should take both embodied,

affective, social and cognitive aspects into account. Furthermore, we suggest that future studies should investigate deep learning in a broader array of school subjects and in the lower age ranges of compulsory education.

In article 2 we find that the teachers' intentions for *uteskole* are to facilitate first-hand experiences outdoors for their pupils and that they teach and organise *uteskole* in two distinct ways: 1) *friluftsliv* activities [outdoor living activities] and 2) theoretical learning activities. The connections between *friluftsliv* activities and theoretical learning activities are seldom emphasised, and the teachers rarely organise learning activities that entail pupils' interacting with their surroundings in relation to other school subjects than physical education. Based on these findings, we discuss how the teachers' intentions and practise can be understood through the Romantic and the Pragmatist perspectives of experiential education and the representational epistemology of traditional schooling.

In article 3 we find that in *uteskole* the pupil's experience: 1) *movement in and across varied terrain*, and 2) *organised outdoor learning activities*. We analyse these findings through Dewey's notion of experience and Nicol's multimodal model of knowing and argue that the learning activities related to the school subjects of science and physical education in *uteskole* may facilitate deep learning processes. We conclude 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.

In the narrative (kappen) of this thesis, I elaborate on the rationale, the context, the theoretical perspective, and the methodology and methods of the research project. Furthermore, I elaborate on the results and findings in the three articles and discuss their contribution to the research project as a whole. Firstly, I discuss how the concepts of deep learning identified in article 1 can be adapted to an experiential education framework through pragmatist philosophy, in particular the ideas of Dewey. Secondly, I outline how these concepts can be operationalised in an *uteskole* context through Nicol's model of knowing. Thirdly, I suggest that there is not one coherent practice of *uteskole* but at least three distinct practices: *uteskole as friluftsliv*, *uteskole as indoor learning activities outdoors* and *uteskole as an integrated practice*. Fourthly, I argue that *uteskole as an integrated practise* facilitates deep learning processes according to an experiential education framework.

Summary Norwegian

Gresset *er* grønnere utendørs – Potensialer for dybdelæring i norsk *uteskole*

I denne artikkel-baserte avhandlingen undersøker jeg hvordan begrepet dybdelæring er forstått i tidligere forskning i barne-, ungdom-, og videregående skole, og hvordan uteskole kan praktiseres for å legge til rette for dybdelæringsprosesser.
Disse hovedspørsmålene er operasjonalisert i fem underspørsmål:

1. Hvordan er dybdelæring konseptualisert og definert i tidligere forskning i barne-, ungdom- og videregående skole?
2. Hvordan kan konseptualiseringer av dybdelæring bli forstått innenfor erfaringsbasert utdanning?
3. Hva er lærerens intensjoner med regelmessig uteskole?
4. Hvilke aktiviteter og strategier tar lærere i bruk når de praktiserer regelmessig uteskole?
5. Hvilke erfaringer har elever med regelmessig uteskole og hvilke spor av dybdelæring reflekteres i disse erfaringene?

Målet med dette prosjektet er, først å skaffe en oversikt over hvordan dybdelæring er konseptualisert i tidligere forskning i barne-, ungdom-, og videregående skole gjennom en systematisk kartleggingsstudie av begrepet dybdelæring og å tilpasse disse konseptualiseringene til et rammeverk for erfaringsbasert utdanning [experiential education]. Deretter, utforsker jeg læreres intensjoner og praksis, og elevers erfaringer med regelmessig uteskole gjennom et tremåneder langt feltarbeid med deltagende observasjon, etterfulgt av kvalitative intervju med lærere og elever ved to barneskoler i Norge. Studiens teoretiske perspektiv er fundert på et rammeverk for erfaringsbasert utdanning, basert på John Deweys utdanningsfilosofi, Arne Jordets didaktiske modell for uteskole og Robbie Nicols ‘fire former for kunnen’.

I artikkel 1 finner vi to hoved-konseptualiseringer av dybdelæring i tidligere forskning i barne-, ungdom-, og videregående skole: *meningsfull læring* og *overføring av læring*, og at begge konseptene fokuserer på kognitive forståelser av læring. Vi finner også at dybdelæring har blitt undersøkt over hele verden, men stort sett i tilknytning til språkfag, matematikk og naturfag [science], og med informanter i alderen 13-16 år. I denne artikkelen argumenterer vi for at en vektlegging av kognitive aspekter ved læring ikke er tilstrekkelig hvis den skal

kunne beskrive elevers læring i alle skolefag og i læringssituasjoner i barne-, ungdom-, og videregående skole, og anbefaler at fremtidige studier av dybdelæring også vektlegger kroppslige, følelsesmessige, sosiale og kognitive aspekter ved læring. Vi anbefaler også at fremtidige studier bør undersøke dybdelæring i et bredere spekter av skolefag og i de laveste aldersgruppene av obligatorisk utdanning.

I artikkel 2 finner vi at lærernes intensjoner for bruk av regelmessig uteskole er å legge til rette for at elevene skal få førstehåndserfaringer utendørs og at de legger opp undervisningen på to distinkte måter: 1) friluftslivsaktiviteter og 2) teoretiske læringsaktiviteter. Det er sjelden at sammenhengen mellom friluftslivsaktivitetene og de teoretiske aktivitetene vektlegges av lærerne, og at det kun er noen ganger at det blir tydelig at lærerne lykkes med å legge til rette for læringsaktiviteter hvor elevene er i interaksjon med omgivelsene i tilknytning til andre fag en kroppsøving. Basert på disse funnene, diskuterer vi hvordan lærernes intensjoner og praksis kan forstås gjennom romantiske og pragmatiske filosofiske perspektiver fra erfaringsbasert utdanning og skolens tradisjonelle vektlegging av representasjonell epistemologi.

I artikkel 3 finner vi at elevenes erfaringer med uteskole i hovedsak handler om 1) bevegelse i og gjennom variert terreng, og 2) organiserte læringsaktiviteter. Vi analyserer disse funnene ved hjelp av Deweys forståelse av erfaring og Nicols 'fire former for kunnen', og argumenterer for at læringsaktivitet i uteskole knyttet til skolefagene naturfag og kroppsøving ser ut til å kunne legge til rette for dybdelæring. Vi ser det som viktig å utnytte potensialet for dybdelæring gjennom uteskole, og at det bør fokuseres på at elevene får være i transaksjon med relevante omgivelser, og at det etableres en kontinuitet mellom læringsaktivitetene som foregår i klasserommet og på uteskole. Vi anbefaler også at lærere varierer omgivelsene de velger å legge uteskole til, slik at det er mulig å inkorporere flere skolefag i praksisen.

I avhandlingens kappe gjør jeg rede for forskningsprosjektets rasjonale, kontekst, teoretiske perspektiv, metodologi, og metode. Deretter utdyper jeg prosjektets funn og diskutere disse opp mot forskningsprosjektets overordnede mål. Jeg drøfter hvordan konseptualiseringene av dybdelæring som ble funnet i artikkel 1 kan tilpasses et rammeverk for erfaringsbasert utdanning ved hjelp av pragmatisk filosofi, særlig gjennom Deweys pedagogiske filosofi. Så viser jeg hvordan disse konseptene kan operasjonaliseres i en uteskolekontekst gjennom Nicols 'fire former for kunnen'. Deretter hevder jeg at uteskole ikke er sammenhengende praksis, men at den består av minst tre distinkte praksisformer: 1) *uteskole som friluftsliv*, 2) *uteskole hvor innendørs læringsaktiviteter tas med ut*, og 3) *uteskole som en integrert praksis*. Til slutt

argumentere jeg for at uteskole som integrert praksis legger til rette for dybdelæringsprosesser i tråd med et rammeverk for erfaringsbasert utdanning.

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Attachment 7: Assessment from Norwegian Centre for Research Data (NSD)

Article 1

Winje, Ø., & Løndal, K. (2020). Bringing deep learning to the surface: A systematic mapping review of 48 years of research in primary and secondary education. *Nordic Journal of Comparative and International Education (NJCIE), 4*(2), 25-41.
DOI: **https://doi.org/10.7577/njcie.3798**

Article 2

Winje, Ø., & Løndal, K. (2021). Theoretical and practical, but rarely integrated: Norwegian primary school teachers' intentions and practices of teaching outside the classroom. *Journal of Outdoor and Environmental Education, 24*(2), 133-150.
DOI: **https://doi.org/10.1007/s42322-021-00082-x**

Article 3

Winje, Ø., & Løndal, K. (2021). 'Wow! is that a birch leaf? In the picture it looked totally different': a pragmatist perspective on deep learning in Norwegian 'uteskole'. *Education 3-13, 51*(1), 142-155. DOI: **https://doi.org/10.1080/03004279.2021.1955946**

1. Introduction

The main theme studied in this article-based dissertation is *deep learning* in Norwegian *uteskole* [outdoor school]. The Scandinavian practice of *uteskole* entails regular weekly or bi-weekly visits to local and outdoor environments and a focus on learning activities that support the development of problem-solving abilities, practical knowing and opportunities for pupils to test their knowledge and skills in contexts other than the classroom (Barfod, 2018a; Bentsen & Jensen, 2012; Jordet, 2010; Waite, Bølling, & Bentsen, 2016). From a pragmatist theoretical perspective, I investigate how weekly *uteskole* in primary education can facilitate deep learning processes. The project focuses on how the concept of deep learning can be adapted to primary education through an experiential education framework and how this adaptation provides opportunities to discover, investigate and facilitate *deep learning processes* in *uteskole*. The overall aim of this project is to explore how deep learning can be understood within an experiential education framework, incorporating the embodied, affective and emotional aspects of learning, in addition to the cognitive perspectives on which the concept is commonly based. I also want to contribute to research-based knowledge of how *uteskole* is practised in Norway and ask questions that can further its development. The specific research questions will be presented in Chapter 1, Section 6.

1.1. Positioning

Maxwell (2013) notes that personal interest is a major, usually unexamined, factor in choosing a research topic. This section is my attempt to provide a personal account of my position as the researcher. The aim of this section is not only to provide a biographical account but also to highlight the connections between the researcher, the research topic and questions, the participants and the data in order to provide validity and reliability to the research findings. Hopefully, this section will help me and readers understand my inherent influence over the research process, making my bias and subjectivity visible.

My interest in *uteskole* stems from two main sources: my experiences with investigating it in my master's thesis (Winje, 2013) and my experiences with establishing and practising *uteskole* in a primary school in Oslo, Norway, from 2013 to 2016. After completing my master's thesis, I was eager to apply *uteskole* and was given the opportunity to conduct regular *uteskole*, along with a team of other teachers, at a primary school in Oslo. My moment of epiphany occurred when I stood at our *uteskole* location and hung laminated worksheets on fractions in surrounding trees. At that moment, I realised that I was giving my pupils tasks which were clearly more appropriate to be solved using pen and paper inside a classroom. The

tasks on these worksheets were not connected with the *uteskole* location; I simply took the learning activities we normally did indoors and transferred them outdoors. Although I, at that moment, recognised that something was not quite right, I was not able to formulate an alternative and to design learning activities that were meant to take advantage of the learning potential of the outdoors. I did not know which types of tasks I should be designing to make them suitable for the outdoors, in line with the didactic model of *uteskole*. This uncomfortable sensation of not quite understanding how to design appropriate learning activities for *uteskole* made me question my rationale for practising it in the first place. I tried to express my unease to the other teachers, but we all lacked a language to speak about the different ways of teaching and learning in *uteskole*. There was an inherent paradox in our practice. We argued for using *uteskole* as a way to provide the pupils with first-hand experiences relevant to attaining the aims in our curriculum, but we struggled to express how these activities should be different from those we carried out indoors. It seemed as if we lacked a language or concepts for describing which activities were more suitable and relevant to conduct outdoors.

In 2016, I was given the opportunity to apply for a PhD scholarship in which I can investigate deep learning in *uteskole*, with a focus on the opportunities that *uteskole* has in terms of providing novel contexts for pupils to test their knowledge and skills. I also wanted to use this chance to contribute to the common language of *uteskole* and to aid efforts towards developing a practice that takes advantage of the pedagogical potential in *uteskole*.

Any findings in this enquiry were analysed and interpreted by me and were situated in my subjective understanding of the data. However, I also had the opportunity to present my work and receive critical feedback in my research group at Oslo Metropolitan University and through national and international conferences. Furthermore, all the articles were subjected to peer reviews prior to publication. I attempted to describe my own subjectivity and also provided detailed theoretical (see Chapter 3) and methodological perspectives (see Chapter 4). I hope that this material will help readers evaluate the veracity of any claims made by this research enquiry.

1.2. 21st-century skills and competencies

Since the turn of the last century, there has been an increased emphasis on revising education internationally in response to the economic, environmental and social challenges of the 21st century (Dumont, Instance, & Benavides, 2010; Pellegrino & Hilton, 2012). The main focus is teaching pupils to read and think critically, express themselves clearly and persuasively,

participate in democratic processes both locally and globally, and manoeuvre competently amidst the amount of information available across multiple platforms.

According to governmental organisations, such as the European Union, the Organisation for Economic Co-operation and Development (OECD) and the United States National Research Council (NRC), together with semi-commercial organisations, such as the Partnership for 21st Century Skills (2015), ATC21STM (Griffin, McGaw, & Care, 2012) and EnGauge (Burkhardt et al., 2003), public education should provide young people with the knowledge and experiences to become responsible citizens, decision makers and problem solvers capable of addressing serious economic, environmental and social issues. These types of aptitudes and knowledge are often described as *21st-century skills* or *21st-century competencies*. The OECD report entitled *The Nature of Learning* (Dumont et al., 2010) describes the situation as follows:

> Global drivers are pushing all countries to give priority to generating high levels of knowledge and skills with attention increasingly to more demanding forms of '21st century competences'. The corollary concern is that traditional educational approaches are not adequately delivering on such demanding agendas. (p. 3)

It is argued that pupils now need to attain mastery across multiple areas of knowledge and skills that were previously unnecessary for individual success in education and the workplace, combined with the requirement to attain competence in digital technology. Several frameworks have been developed to support these efforts, emphasising skills such as problem solving, digital competence, critical thinking, cooperation and students' abilities to transfer knowledge and skills from one context to another. This has led to an increase in both the development and revitalisation of terms describing these knowledge sets and skills, and one of the most prevalent terms is *deep learning* (Dumont et al., 2010; Pellegrino & Hilton, 2012).

1.2.1. Deep learning – in educational policy documents

In international and national educational policy documents, there are several similar-sounding terms, such as *deep learning*, *deeper learning* and *in-depth learning*, which populate what we might call 'the discourse of 21st century skills and competencies' (Dumont et al., 2010; Ohlsson, 2011; Pellegrino & Hilton, 2012; The Norwegian Directorate for Education and Training, 2020). This might be explained by the number of different frameworks and conceptualisations, as, for example, described by the OECD (Dumont et al., 2010):

> The importance of establishing the foundations for lifelong competence and capacity to learn is repeatedly underscored, whether defined as 'adaptive competence' or 'meaningful learning' or 'deep learning' or 'generative processing' – all of which are understood to enable critical thinking, flexible problem-solving, and the transfer of

> skills and use of knowledge acquired in one situation to address problems arising in new situations. (p. 330)

This quote from the OECD report describes deep learning as one among several terms with overlapping definitions and that these terms all seemingly entail skills such as critical thinking, problem solving and the ability to transfer knowledge and skills to new contexts. In 2012, the United States NRC published its report entitled *Education for Life and Work*, which defined *deeper learning* as a process leading to the transfer of learning (Pellegrino & Hilton, 2012):

> We define 'deeper learning' as the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations (i.e., transfer). (p. 5) (…) While other types of learning may allow an individual to recall facts, concepts, or procedures, deeper learning allows the individual to transfer what was learned to solve new problems. (p. 6)

This definition of deeper learning indicates that it is not primarily about remembering facts, concepts or procedures but being able to use one's knowledge and skills on problems in novel situations. In 2018, the United States National Academies of Sciences, Engineering, and Medicine (2018) published a consensus report entitled *How People Learn II*, which described deeper learning as follows:

> Deeper learning involves understanding complex concepts and systems and is manifested in, for example, the use and construction of models (see Chapter 3), the ability to integrate information from multiple documents and experiences (Wiley et al., 2009), and the ability to explain correct versus incorrect system behavior (VanLehn et al., 2016). Deeper learning is needed for complex problem solving, reasoning, inferential thinking, and transfer of knowledge to new situations (Hattie and Donoghue, 2016). (p. 167)

The reports from the OECD, the NRC and the United States National Academies of Sciences, Engineering, and Medicine, all indicate that deep learning or deeper learning is a central concept in the current discourse of 21st-century skills. This discourse has also affected Norwegian educational discourse and curriculum reform processes.

1.2.2. The Norwegian curriculum reform and the conceptualisation of in-depth learning

In 2013, the Norwegian Directorate for Teaching and Training initiated a process of reforming the national curriculum in primary and secondary education. A committee was appointed to assess the subjects in primary and secondary education and training in terms of the requirements for competencies in future working life and society. The results of the committee's work were published in two reports (NOU 2014:7, 2014; NOU 2015:8, 2015), and a central

term in both reports is *in-depth learning* [dybdelæring]. It was argued that facilitating in-depth learning in school will help pupils master key elements in their subjects better and make it easier to transfer learning from one subject to another. This was described in the main report entitled *The School of the Future* (NOU 2015:8, 2015):

> The most important point of a competence is its application, in other words, the capacity to use and apply knowledge and skills to master challenges and solve problems. The knowledge and understanding pupils have of what they have learnt, how they can use what they have learnt and when to use it, play an important part in acquiring competence. Thus the development of competence and in-depth learning are closely linked, [and] the acquisition of competence requires in-depth learning. (p. 10)

The description of the importance of in-depth learning for pupils to understand what they have learned and how they can use it is similar to the descriptions of deep learning and deeper learning described above. The main report also cited both the NRC report, *Education for Life and Work* (Pellegrino & Hilton, 2012), and the OECD report, *The Nature of Learning* (Dumont et al., 2010). This can be interpreted as an indication of a common understanding of the terms, despite the main report preferring to use the term *in-depth learning* over *deep learning* or *deeper learning*. In 2020, the new Norwegian curriculum was implemented, and in-depth learning was stressed as a key concept (The Norwegian Directorate for Education and Training, 2020). The definition of in-depth learning is only available in Norwegian, and the following is my translation:

> We define in-depth learning as the gradual development of knowledge and a lasting understanding of terms, methods and relationships in school subjects and between subject areas. This entails that we reflect on our own learning and use what we have learned in different ways in known and unknown situations, alone or together with others. (The Norwegian Directorate for Education and Training, 2020)

There are clear similarities between the definition of in-depth learning presented in the Norwegian curriculum and the definitions of deep learning and deeper learning within the discourse of 21st-century skills and competencies. There is an emphasis on understanding rather than rote learning and on pupils' abilities to use what they have learned in novel contexts. We now have a glimpse of how deep learning is described in the discourse of 21st-century skills and competencies. Next, I elaborate on how deep learning is conceptualised within educational research.

1.2.3. Deep learning – in educational research

The concept of deep learning was first used by Craik and Lockhart (1972) in relation to research on memory, particularly the difference between long- and short-term memory, and it

emphasised the importance of deep-level processing to facilitate the former. Since the 1970s, several research groups around the world have worked on the distinction between *deep learning* and *surface learning*, with the former referring to learning with understanding and the latter referring to more temporary learning.

In relation to education, a decisive contribution to the conceptualisation of deep learning was Marton and Säljö's (1976a) study of Swedish university students, which found that what a student intends to get out of learning determines whether a deep learning approach or a surface learning approach will be used. This is regarded as one of the seminal studies of deep learning in education and has contributed to the development of the theoretical model later known as *student approaches to learning*. According to Cano (2007), several research branches have extended from this seminal study; the most influential ones are John Biggs' (1987, 1993) work in Australia and Noel Entwistle's (1981, 1987) work in the UK.

I was not able to identify any publications providing a systematic literature review of studies on deep learning in primary and secondary education. To date, the work of Beattie, Collins and McInnes (1997) is the only literature review article describing the findings of foremost research groups investigating the concept of deep learning; however, the emphasis in this article was higher education, particularly studies deemed relevant for accounting education. The study synthesises definitions of deep learning and finds that a deep approach to learning is shown by students who 1) seek to understand the meaning of the teaching materials, 2) relate ideas to their previous knowledge and experiences and 3) examine the logic of the arguments and relate the evidence presented to the conclusions. Meanwhile, a surface approach to learning is shown by students who 1) memorise parts of the content of the teaching materials and accept the material presented without questions, 2) concentrate on memorising facts rather than distinguishing any underlying principle or pattern and 3) are influenced by assessment requirements. Based on Beattie et al.'s (1997) findings, deep learning can be regarded as an approach that learners adopt to understand the meaning of what they are learning and relate it to their previous knowledge and experiences in a critical manner.

In summary, in the international educational policy discourse purporting the importance of 21st-century skills and competencies, deep learning seems to be understood as a process which makes learners capable of understanding what they have learned and taking what was learned in one situation and applying it to a problem in a novel situation. By contrast, Beattie et al.'s (1997) review of empirical research on deep learning approaches in higher education defines a deep learning approach as learners' attempts to understand the meaning of what they

are learning by relating it to their previous knowledge and experiences in a critical manner. In this dissertation, I decided to use the term *deep learning* as an umbrella term for all the varieties of this concept, including in-depth learning and deeper learning, which populate this discourse.

1.3. Connection between deep learning and outdoor education

So, how can learning activities that facilitate deep learning in primary and secondary education be organised? According to the previously referenced OECD report, *The Nature of Learning*, 'traditional educational approaches are not adequately delivering on such demanding agendas' (Dumont et al., 2010, p. 3), whereas the NRC underlines that 'Today's educational policies and practices will need updating to help all children develop transferable knowledge and skills' (Pellegrino & Hilton, 2012, p. 15). Tochon (2010) suggests a *deep turning* in education:

> The deep approach is an applied trend that is revolutionizing the ways we think about what should be accomplished in Education and Teacher Education, and how it should be done. It defines a move towards deeper conceptions of curricula in any disciplines and towards curriculum interconnectedness. (p. 1)

The focus on deep learning in both national and international educational discourses, combined with the suggestion to revise education and teacher education, might be interpreted as a move away from traditional educational approaches towards more progressive ones. As described above, central to the conceptualisation of deep learning is 1) the emphasis on pupils' abilities to understand the learning material by relating it to their prior knowledge and experiences and 2) their abilities to use what they have learned in novel contexts. This puts pupils' first-hand experiences and the context of the learning activities to the forefront, prompting questions, such as the following: How can schools and teachers provide such opportunities if the learning activities in schools are mainly carried out within the school building and predominantly within classrooms? A possible solution may be to look at educational practices emphasising first-hand experiences and using a variety of learning contexts, both indoors and outdoors. This aligns well with the central idea of *experiential education*, an educational approach that focuses on the educative power of direct experience (Roberts, 2012). Experiential education encompasses a variety of curriculum projects, but one of the most interesting in this regard is the sub-field of *outdoor education*. Remmen and Iversen (2022) state that outdoor education builds on the idea that the location where teaching and learning occur is significant.

The location can be a variety of settings outside of the school buildings, such as school grounds, city parks, museums, science centres, botanical gardens, farms, school gardens, nature parks, residential centres and natural landscapes.

The context of outdoor education is not limited to outdoors in the literal sense but instead indicates that the location is somewhere other than the traditional classroom. Therefore, outdoor education cannot be regarded as a specific method or approach; it includes a variety of pedagogical approaches and practices depending on the purposes and philosophies of the practitioners. Remmen and Iversen (2022) suggest that some of this variation in practice can be ascribed to cultural differences across schools, geographical regions, countries and even continents. Recently, the concept of *uteskole* has become dominant in the outdoor education literature in Scandinavian countries—Denmark, Sweden and Norway.

1.4. *Uteskole*

Uteskole [outdoor school] is a Scandinavian practice situated in the socio-cultural context of Norwegian [*uteskole*], Danish [*udeskole*] and Swedish [*utomhuspedagogik*] education tradition, in which regular weekly or bi-weekly visits to local and outdoor environments are used to support pupils' learning by contextualising the learning content in concrete experience in order to provide authenticity to the learning process (Waite et al., 2016). This teaching method has been described as initiating enquiry-based problem-solving activities and explorative and practical approaches and is mainly used in primary schools (Barfod, Ejbye-Ernst, Mygind, & Bentsen, 2016). According to Becker, Lauterbach, Spengler, Dettweiler and Mess (2017), *uteskole* can be distinguished from the Anglo-Saxon term *outdoor education*, which is an umbrella term for teaching, learning and experiencing in an outdoor or out-of-school environment. In contrast to traditional outdoor education programmes, *uteskole* is a teaching method embedded within the curriculum and conducted regularly within the school schedule. In Scandinavian countries, teachers traditionally have autonomy in deciding teaching methods, paired with an emphasis on *Bildung*, in which the individual is formed in their own right and the enactment of the curriculum is responsive to the individual rather than vice versa (Waite et al., 2016).

Research on *uteskole* documents an increase in pupils' *physical activities* (Bølling, Mygind, Mygind, Bentsen, & Elsborg, 2021; Schneller, Schipperijn, Nielsen, & Bentsen, 2017), *school motivation* and *psychosocial well-being* (Bølling, Niclasen, Bentsen, & Nielsen, 2019) and

academic skills (Fägerstam, 2014; Fägerstam & Blom, 2013; Otte et al., 2019). Research on *uteskole* will be elaborated on further in Chapter 2.

The prevalence of *uteskole* in Scandinavian schools has not yet been thoroughly mapped. In Norway and Sweden, no recent published research studies have mapped *uteskole* at a national level. In Denmark, the prevalence of *udeskole* was mapped twice in the last two decades, first, by Bentsen, Jensen, Mygind and Randrup (2010) and, second, by Barfod et al. (2016); it was found that approximately 15% of all Danish schools had one or several classes practising *udeskole* in 2007, whereas about 18.4% of all primary schools practised *udeskole* in 2013/2014. Barfod (2018a) describes how *udeskole* in Denmark developed from a grassroots movement among teachers to a central component of educational policy and from being singular occurrences to gaining nationwide prevalence. She underlines that the increased prevalence also enhances the need for critically describing and assessing *udeskole* and that it must evolve from being the grassroots foundation of an unclearly defined holistic movement against teaching indoors. There are some published studies describing what *uteskole* entails and how its development and dissemination can be supported (Barfod & Stelter, 2019; Dahlgren & Szczespanski, 1997; Jordet, 2007, 2010; Wilhelmsson, Ottander, & Lidestav, 2012). However, there is a lack of studies examining what *uteskole* does not include.

1.4.1. Uteskole and deep learning

There are clear similarities between the conceptualisations of deep learning described above, such as understanding learning content and problem solving in novel contexts, and the aspects of teaching and learning emphasised in *uteskole*. According to Jordet (2010), who has developed a didactic model for *uteskole* in Norway, two foundational aspects of *uteskole* are 1) facilitating opportunities for pupils to test their knowledge and skills in novel contexts and 2) helping pupils understand by establishing a connection between their first-hand experiences and the school curriculum. Both aspects are clearly reflected in the conceptualisations of deep learning described above. However, Dettweiler, Lauterbach, Mall, and Kermish-Allen (2022) stress that very little is known about the use of *uteskole* for the development of 21st-century skills and competencies, such as deep learning. Remmen and Frøyland (2013, 2014, 2015a, 2015b) have conducted a series of studies examining students' learning processes in outdoor education using a deep learning theoretical framework, not explicitly connecting this with pupils' development of 21st-century skills and competencies but rather applying the deep learning framework to describe and assess the quality of students' learning. These studies are all conducted within the pedagogical approach of fieldwork and investigate the quality of high

school/upper secondary pupils' learning in relation to the school subject of geoscience. Although a central aspect of *uteskole* is the weekly or bi-weekly regularity of outdoor experiences (Barfod, 2018a; Jordet, 2010), whereas the fieldwork in these studies is described as separate instances, for example, six times during a school year, the findings and suggestions of the studies conducted by Remmen and Frøyland (2013, 2014, 2015a, 2015b) are interesting in relation to future practice of uteskole. Among the suggestions to facilitate deep learning processes are 'conducting fieldwork close to the school' (Remmen & Frøyland, 2015a, p. 132) because of the shorter travel time and students' familiarity with their local community, which means that they do not need much time and focus to adapt to an unknown place. 'Situating the (…) content in a real-life issue that requires students to form an opinion or suggest a solution' (p. 132) has also been suggested because this leads to greater engagement and motivation for completing the learning tasks. In their article from 2014, (Remmen & Frøyland, 2014) describe how alternating between the indoor and outdoor contexts facilitate deep learning processes compared with a linear indoor–outdoor–indoor process.

These recommendations from Remmen and Frøyland (2014) on how to facilitate deep learning processes in outdoor education through fieldwork resemble what Jordet (2010) describes as an ideal *uteskole* practice. *Uteskole* should be carried out weekly or bi-weekly to facilitate regular first-hand experiences with real-life contexts and to provide a regular alternation between classroom and outdoor learning activities. *Uteskole* should be conducted in pupils' and schools' local communities because doing so establishes a connection between the pupils and their local environments, and it also saves time and resources (e.g. transportation costs). *Uteskole* practitioners should aim to facilitate learning activities that focus on problem solving, either actual problems or fictional ones but realistic problems that are ideally about challenges in the local community. Remmen and Frøyland (2013, 2014, 2015a, 2015b) have documented a clear potential for facilitating deep learning processes in outdoor education. I argue that many of the suggestions they provide resemble the didactic model of *uteskole* described by Jordet (2010).

1.5. Knowledge gap

The current international and national educational discourse not only emphasises developing 21st-century skills and competencies but also highlights that traditional educational approaches are not sufficiently delivering on such demanding requirements (Dumont et al., 2010; Pellegrino & Hilton, 2012; The Norwegian Directorate for Education and Training, 2020). This is an indication that there is a need for changes in how we facilitate teaching and

learning in public education. As documented by Remmen and Frøyland (2013, 2014, 2015a, 2015b), outdoor education is a pedagogical approach that has the potential to facilitate deep learning processes. However, there are knowledge gaps about deep learning and outdoor education, and these will be presented in the following sections.

1.5.1. Conceptualisations of deep learning within research in primary and secondary education?

It is challenging to obtain a clear overview of how deep learning or similar terms are actually conceptualised within primary and secondary education. The term has been examined in academic publications (Bransford, Brown, & Cocking, 1999; National Academies of Sciences et al., 2018; Ohlsson, 2011; Tochon, 2010; Østern et al., 2019), used in political policy reports and documents (Dumont et al., 2010; NOU 2014:7, 2014; NOU 2015:8, 2015; Pellegrino & Hilton, 2012), mentioned in national curricula (The Norwegian Directorate for Education and Training, 2020) and highlighted in mainstream media coverage of education. However, with similar terms, such as deep learning, deeper learning, in-depth learning, deep learning approach and deep-level processing, all being part of the discourse, combined with partially overlapping and unclear definitions, confusion and uncertainty arise regarding what the term *deep learning* actually means, its origin and its empirical support. Adding to this confusion, deep learning is prevalent in discourses other than education, such as in research on artificial intelligence and machine learning (Aizenberg, Aizenberg, & Vandewalle, 2000; Dechter, 1986). To investigate how *uteskole* can contribute to deep learning, I need to establish an overview of how it is conceptualised in empirical research in primary and secondary education and assess whether this conceptualisation is compatible with the pedagogical philosophy on which *uteskole* is founded.

1.5.2. Suggestions for a broad understanding of deep learning

Some researchers, such as Tochon (2010) and Dahl and Østern (2019), stress that deep learning seems to be a concept that has mainly been investigated and described according to cognitive perspectives on learning. Tochon (2010) argues that depth in education requires that both students' and teachers' identities be activated and affected and that both learners and teachers be given opportunities to understand their existence and their own roles in society and the world. He problematises that deep learning has mainly been investigated and described through cognitive learning theory; he underlines that deep learning 'engages students intellectually, socially, and emotionally' and moves 'beyond temporary gains in achievement scores

to create lasting, meaningful improvements in learning' (p. 5). Dahl and Østern (2019), building on Tochon's (2010) ideas, emphasise the last 30 years of research in modern neuroscience and also question the emphasis on cognitive perspectives regarding deep learning. The studies by neurobiologist Damasio (1994, 2000, 2012) show that our entire body is affected by our brain through pre-reflective processes affecting blood circulation, the intestines and muscle apparatuses. The body keeps the score, actions are affective and emotionally anchored, and cognition emerges from the intra-action with affects. This provides opportunities to add to the understanding of learning beyond the cognitive perspective. Damasio's studies underscores that there are no clear lines separating the cognitive from the affective, social and embodied aspects of learning. It is the *totality* of these aspects, according to Tochon's (2010) redefinition, that results in deep learning. Several researchers argue that there is a need for studies on deep learning that apply a broader theoretical framework, including the embodied, social, emotional and cognitive aspects of learning (Dahl & Østern, 2019; Lindholm, 2021; Tochon, 2010). This also ties directly to the conceptualisation of deep learning when investigated within an outdoor education context.

1.5.3. Deep learning in primary education

Dahl and Østern (2019) highlight that the aims of higher education and those of general compulsory education are very different. They describe a change in the recent Norwegian curriculum reform (NOU 2014:7, 2014; NOU 2015:8, 2015), in which the conceptualisation of deep learning has moved from the context of higher education to that of general education. They argue that deep learning, a concept that has been developed in relation to adults' learning of theoretical knowledge (Beattie et al., 1997), has now—seemingly without resistance—been positioned as a central element in children's and youths' learning. Consequently, the lack of research on deep learning in the lower age ranges of primary education needs to be addressed.

1.5.4. Teachers' experiences of teaching outside the classroom

International reviews of outdoor learning programmes have found that regular compulsory school- and curriculum-based programmes can promote pupils' development in the social, academic, physical and psychological dimensions (Becker et al., 2017; Rickinson et al., 2004). According to Guardino, Hall, Largo-Wight and Hubbuch (2019), classes held outdoors provide an authentic and engaging environment, as well as opportunities to integrate content area subjects with outdoor experiences. Studies report that integrating outdoor learning programmes may be challenging because of a lack of support from the school administration and colleagues, limited resources, limited time and risk management considerations (Bentsen et

al., 2010; Remmen & Iversen, 2022; Rickinson et al., 2004). Barfod (2018a) describe that most research on *uteskole* has focused on pupils' learning outcomes, whereas few studies have explored teachers' lived experiences of teaching outside the classroom. Remmen and Iversen (2022) have identified 13 studies examining teachers' experiences with outdoor education and found that teachers experience improved relations with their pupils but also report frustration regarding the lack of time for planning and conducting *uteskole*. They have also found that teachers regard *uteskole* as an unpredictable setting which allows for student enquiries but that there are variations in teachers' intentions and practices with outdoor education. Remmen and Iversen (2022) report that some studies on outdoor education investigate teaching and learning across the classroom and the outdoors through fieldwork in geoscience, but none has examined this in the context of *uteskole*.

1.5.5. Pupils' learning in uteskole

Research on pupils' learning outcomes from *uteskole* documents an increase in pupils' *physical activities* (Bølling et al., 2021; Schneller et al., 2017), *school motivation* and *psychosocial well-being* (Bølling et al., 2019) and *academic skills* (Fägerstam, 2014; Fägerstam & Blom, 2013; Otte et al., 2019). Few studies explore the concrete learning processes in *uteskole*, but those conducted by Remmen and Frøyland (2013, 2014, 2015a, 2015b) describe pupils' learning through fieldwork in geoscience through a cognitive perspective on deep learning. There is clearly a need for studies that examine pupils' learning in *uteskole* through a broader perspective on deep learning.

1.5.6. Knowledge gap summary

First, because of the plethora of similar and overlapping terminology and conceptualisations regarding deep learning, there is a need to establish an overview of how it is conceptualised within previous research in primary and secondary education. Second, it is suggested that the current conceptualisations of deep learning are based mostly on cognitive learning perspectives, so there is a need to explore how it can be understood within an experiential education framework, incorporating the embodied, affective and emotional aspects of learning, in addition to the cognitive perspective on which the concept is commonly based. Third, an introduction into the pragmatist philosophy on which experiential education is founded may guide my efforts to investigate deep learning in *uteskole* and may be used as a foundation for subsequently investigating and understanding teachers' and pupils' experiences with *uteskole*. Fourth, teachers' experiences with *uteskole* need further investigation, particularly their teaching across classrooms and the outdoors and whether deep learning processes can implicitly be

found in their teaching. Fifth, studies focusing on pupils' learning in *uteskole* are needed, such as how they perceive and experience the learning processes potentially leading to deep learning.

1.6. Aim of the study

The overarching research questions for this PhD project are as follows:

> *How is deep learning understood in educational research, and how can uteskole be practised to facilitate deep learning processes?*

These main research questions are operationalised into five research sub-questions:

1. How has deep learning been conceptualised and defined in previous research on primary and secondary education?
2. How can the conceptualisations of deep learning be understood within an experiential education framework?
3. What are teachers' intentions in practising regular *uteskole*?
4. What activities and strategies do teachers utilise when practising *uteskole*?
5. How do primary school pupils experience regular *uteskole*, and how is deep learning reflected in these experiences?

1.7. Structure of the thesis

The project consists of three distinct studies reported in three published articles: one systematic mapping review of previous research on deep learning in primary and secondary education and two articles reporting on a three-month fieldwork with participatory observation and qualitative interviews carried out in two Norwegian primary schools with regular *uteskole*. The systematic mapping review (Winje & Løndal, 2020), covers a span of 50 years of peer-reviewed studies, aiming to establish how deep learning is conceptualised and defined in previous research on primary and secondary education; it answers research sub-question 1. The review provides a conceptual foundation for exploring (deep) learning in experiential education and the subsequent fieldwork of regular *uteskole*. The second article (Winje & Løndal, 2021a) reports on teachers' experiences with regular *uteskole*; it answers research sub-questions 3 and 4. Finally, the third article (Winje & Løndal, 2021b) reports on pupils' experiences with regular *uteskole*, and the development of a conceptual foundation for deep learning according to an experiential education framework; it answers research sub-question 2 and 5. This narrative of my PhD thesis comprises seven chapters that contextualise and present the rationale for the research project, formulate the research questions, clarify the theoretical perspectives, outline the methodology of the research process and discuss the project's overall contributions based on the three published articles. Following this introductory chapter, Chapter 2 describes the context of the study, and Chapter 3 elaborates the theoretical perspectives

of the thesis. Chapter 4 outlines and reflects upon the methodological considerations, and Chapter 5 summarises the three articles and their main findings and discussion points. Chapter 6 discusses the findings from the three articles and reflects on the strengths and limitations of the research project. Finally, Chapter 7 provides the conclusion of the research project, the implications for the findings and future research directions.

2. Context of the study

Within the last 20 years, several research overviews investigating outdoor education have been published. Rickinson et al. (2004) investigate the opportunities and perspectives within a wide range of outdoor activities, such as outdoor adventures, excursions, fieldwork and projects in local communities. They have studied outdoor activities/outdoor learning through a vast lens and identified 150 relevant studies. They conclude that it has positive effects on student learning, particularly on school motivation. Similarly, Fiennes et al. (2015) conclude that outdoor learning activities have beneficial impacts on learning and that longer interventions have greater effects than short ones. They also stress that the benefits of such activities can be secured if these are well prepared with follow-ups. Both of these large overview studies broadly define outdoor education and include a broad spectrum of activities in their definitions.

Becker et al. (2017) carry out a more focused review of outdoor learning, defined as formal school- and curriculum-based learning involving pupils in the age range of 5–18 years with regular weekly or bi-weekly classes in natural or cultural environments outside the classroom. They identify 13 studies, and the results indicate that regular curriculum-based outdoor learning can contribute to developing the social, academic, physical and psychological dimensions of pupils. They also comment on the low methodological quality in these studies and thus recommend the use of more quasi-experimental design and longitudinal studies with larger samples and higher methodological quality.

Remmen and Iversen (2022) conduct a scoping review of 52 empirical studies on outdoor education in primary and secondary education in Nordic countries. They find that most of the studies are qualitative and situated in the primary school context. Their results show that the subject matter addressed in outdoor education includes multiple school subjects and that it is mainly teachers' perspectives that are investigated in these studies. They also highlight the lack of studies examining teaching and learning processes, the use of digital resources and education for sustainability.

In Norway, Sweden and Denmark, there has been a strong mutual inspiration concerning *uteskole* in relation to both practical and theoretical issues (U. Dettweiler & Mygind, 2020). The practice of *uteskole* and research on it are similar across Scandinavian countries, although the landscape and access to nature are different. Therefore, I find it relevant to find support in Swedish and Danish research literature in my examinations of *uteskole* in Norway. According to Dettweiler and Mygind (2020), research activity on *uteskole* in Norway and Sweden can be

considered relatively low, whereas in Denmark, it is significantly higher. In their recent scoping review of school-based outdoor education in Nordic countries, Remmen and Iversen (2022) identify 52 studies: 20 from Denmark, 15 from Norway, 11 from Sweden and 6 from Finland. It is important to note that there is a difference between studies exploring the teaching practices and methods regarding *fieldwork*, *friluftsliv* and *uteskole*, although they can all be categorised as outdoor education.

2.1.1. Uteskole as a Scandinavian tradition

To understand the tradition of *uteskole* in Scandinavian countries, I need to elaborate on the socio-cultural context in which it emerges. The Scandinavian tradition of being outdoors is closely tied to the concept of *friluftsliv* [free air life] and is often associated with the Norwegian philosopher Arne Næss' (1989) ecosophy and a historical emphasis on connecting with nature (Gelter, 2000).

Friluftsliv

The basic idea of *friluftsliv* can be discerned in the practices of outdoor people around the world, but as a specific philosophy, it is unique to Scandinavia. *Friluftsliv* is often regarded as a product of 'the romantic "back-to-nature" movement in the 18th century, as a reaction against urbanization and industrialization, strongly influencing Scandinavian culture' (Gelter, 2000, p. 79); the love for nature was introduced to upper-class society through music, poetry and art. However, the upper class had no authentic connection with nature; they were not hunters, fishermen or farmers. Therefore, *friluftsliv* became a way to realise the ideas of romanticism and to reconnect with nature and the old Scandinavian outdoor tradition. Famous explorers, such as Fridtjof Nansen and Roald Amundsen, the influence of British adventure tourists, such as W.C. Slingsby, J. A. Lees and W. J. Clutterbuck, and the documentation of their journeys also contributed to strengthening and romanticising Scandinavian nature. The world's first tourist organisation, the *Norwegian Tourist Association*, was established in 1868 to 'guide the people back to nature' (Gelter, 2000, p. 79).

In her elaboration of the development of *friluftsliv* in Norwegian primary education, Jørgensen-Vittersø (2021) describes how the concept of *friluftsliv* is associated with the grand narratives of Norwegian national identity accentuating outdoor adventures, foraging and a deep connection with nature. She notes that in the period from 1939 until the 1980s, the concept of *friluftsliv* developed into two approaches: one focusing on the health benefits of *friluftsliv* and another with a more environmental focus, influenced by ideological changes in the curriculum

and environmentalist movements. However, embedded in both approaches is the focus on hiking, orienteering, outdoor camping and other outdoor skills, which have been integral to narratives about Norwegian national identity.

Today, *friluftsliv* is an integral part of Norwegian society, both as a leisure-time activity and, more importantly in this research project, as a central element in the primary and secondary school curriculum (Abelsen & Leirhaug, 2017). It is not only related to the emphasis on ecology and sustainability as overarching elements in the curriculum but also reflected in particular competency aims in the physical education curriculum (The Norwegian Directorate for Education and Training, 2020). *Friluftsliv* is likewise a part of Scandinavian education research, such as the study by Lyngstad and Sæther (2020), in which the concept of *friluftsliv literacy* is developed, drawing on Whiteheads' (2010) concept of *physical literacy*. In their scoping review of outdoor education in Nordic countries, Remmen and Iversen (2022) find that studies relating to *friluftsliv* often investigate health and safety issues because of educational programmes that involve longer trips into natural environments and risky activities, such as hiking, canoeing, skiing and overnights in snow caves. *Friluftsliv* is also discussed in international research in relation to activities and practices involving outdoor and adventure education and the suggested influence it has had on the development of *forest schools* in the UK and *bush schools* in Australia (Knight, 2018; Leather, 2018).

Synnestvedt (1994) describes the background and development of the school subject physical education in Norwegian general education. She writes that knowledge and skills related to *friluftsliv* first became part of the curriculum of physical education in the Norwegian educational system in 1922, when it was implemented that outdoor trips must be carried out both in summer and in wintertime and that it is teachers' responsibilities to plan and organise these trips. According to the curriculum, the aim is to open pupils' eyes to all the beauty in nature and aid them in developing love for nature and their country. The teacher also needs to be capable of giving first aid, if necessary. In skiing trips, pupils should develop their orienteering skills with maps and compasses, and in summertime, they should be given the opportunity to swim outdoors. These elements of the physical education curriculum clearly prescribe activities that must be carried out outdoors throughout the year. Synnestvedt (1994) describes that similar activities have had a place in the Norwegian physical education curriculum since 1922. According to Jørgensen-Vittersø (2021), the term *friluftsliv* was first used in the national curriculum in 1939. In the 1994 national curriculum, *friluftsliv* became a main theme in the higher secondary education curriculum, and in the national curriculum of 1997, the concept

had gained a significant position, with clear aims and goals throughout the curriculum (Helle, 2017). Pupils were required to experience nature, gain practical experience and develop knowledge and understanding of human beings' place in nature. It was also underlined that *friluftsliv* was part of Norwegian culture and provided a foundation for a physically active lifestyle. Helle (2017) describes that the 1997 curriculum highlights the importance of using the local area as a resource for teaching and learning in school. Norwegian educators and practitioners within the field of *friluftsliv* stress that John Dewey's notions of learning are particularly suitable for learning about *friluftsliv* because of his emphasis on learning by doing (Helle, 2017). Tordsson (2006) argue that when practicing *friluftsliv*, one learns both in and through the situation. He emphasises that teachers of *friluftsliv* must seek out situations in which pupils can act and reflect both during and after the experience. In 2006, a new national curriculum was implemented in Norway, and *friluftsliv* retained a significant position. In the current curriculum, which was implemented in 2020 (The Norwegian Directorate for Education and Training, 2020), the term *friluftsliv* is still present within the competency aims of physical education. However, its adventurous and sporting aspects have been reduced, indicated by a change from the term *friluftsliv* to the terms *nature wandering* [naturferdsel] and *outdoor activities* [uteaktivitet]; this signals that these activities should be relatively low risk and be practised in local areas (The Norwegian Directorate for Education and Training, 2020).

2.1.2. Research on uteskole in Norway

The emphasis on *friluftsliv* in the Norwegian school curriculum for almost 80 years meant that Norwegian teachers had developed familiarity with and competence in teaching outdoors. The Norwegian curriculum implemented in 1997 focused on using the local community as a resource in schools in relation to all school subjects. In 1998, Norwegian education researcher Arne Jordet (1998) published his first book on the didactic method of *uteskole*. A few years later, he established a research project, the Lutvann project, which was a case study exploring how regular *uteskole* was practised at Lutvann Primary School (Jordet, 2002, 2003, 2007). In 2010, Jordet published the seminal book often referenced in research on *uteskole*, *The Classroom Outdoors* [Klasse-rommet utenfor] (Jordet, 2010), based on his dissertation from 2007 (Jordet, 2007). Jordet (2010) describes that the curriculum revisions and reforms after 1997, which focused on the curriculum's local interpretations by teachers and operationalisation according to local circumstances and conditions, led to an increased focus on *uteskole*, although the term was not explicitly mentioned in the curriculum. Jordet claims that the use of *uteskole* in primary schools emerged through a grassroots movement of teachers. He finds support by

referring to the Rødkilde project (Mygind, 2005), which describes a similar emergence of udeskole in Denmark.

Jordet (2009) argues that *uteskole* should not simply be understood as a narrow teaching method or approach but rather as an educational philosophy. He claims that *uteskole* provides opportunities for pupils to use their bodies and senses actively in the learning process and, through cooperation with their peers, gain personal and concrete first-hand experiences of the world outside the classroom. According to Jordet (2010), *uteskole* allows for an expansion of the context of teaching, in which a relationship is established between the classroom and the outdoors. Jordet bases his didactic model of *uteskole* on John Dewey's educational philosophy. He argues that if Dewey's ideas are to be taken seriously, it has didactic consequences that it will impact both the learning context and the sources of knowledge in school. Jordet asserts that *uteskole* is a teaching and learning practice that aligns well with these didactic consequences, so *uteskole* is a way of operationalising Dewey's pedagogical philosophy in teaching practices. Dewey's notions of experience and education and Jordet's operationalisation will be elaborated on in Chapter 3.

In 2000, a nationwide school survey in Norway was conducted, in which the prevalence of *uteskole* in primary schools was mapped (Bjelland & Klepp, 2000). The survey found that over 90% of first graders had *uteskole* for half days or a whole day per week and that there was a gradual decrease as pupils grew older, with only 10% of seventh graders having *uteskole* once a week. In the early 2000s, several studies mapped the prevalence of *uteskole* in regions of Norway, such as Vestøl (2003) in southern parts of Norway and Limstrand (2001) in northern parts. Lauterbach and colleagues (G. Lauterbach, personal communication, April 12, 2022) are currently mapping the nationwide prevalence of uteskole primary and lower secondary education in Norway, and the preliminary results indicate a much high prevalence than previously supposed. Their preliminary results also indicate that the corona pandemic led to a major increase in schools using outdoor contexts, such as uteskole, to limit the spread of the virus, and that many of the schools' plan to continue using uteskole more regularly after the pandemic. Barfod (2022) reports on a similar tendency in the use of uteskole during and after the pandemic in Denmark.

Relationship between uteskole and friluftsliv

Jordet (2010) explicitly warns about the danger of *uteskole* being locked in particular models in which teachers are overly inspired by their own experiences with, for example, the scouting

movement, social pedagogical perspectives highlighting play, physical activity and well-being, or *friluftsliv*. Lutvann Primary School in Oslo became known in Norway for its conduct of *uteskole* one day per week in all grades, and some of the teachers working there published a book for teachers on how to plan and practise *uteskole* (Hebæk, Sommer Holmen, & Retterstøl, 2002). The book prescribes what to wear and how to stay warm and dry for a day outdoors in the Nordic climate, how to build a campsite and how to prepare food outdoors. The book has elements concerning different school subjects but with an emphasis on knowledge and skills related to competency aims in physical education and biology. *Uteskole* likewise became a course in teacher training programmes and is currently part of the physical education teacher training programmes at several universities in Norway. As these courses are part of the physical education specialisation, the main emphasis seems to be on how to facilitate learning activities related to *friluftsliv* and not necessarily on how *uteskole* can be used in relation to other school subjects. Because of the emphasis on *friluftsliv* in Norwegian society, culture and national curriculum (Abelsen & Leirhaug, 2017; Gelter, 2000; Helle, 2017; Jørgensen-Vittersø, 2021; Synnestvedt, 1994; The Norwegian Directorate for Education and Training, 2020), the formulation of *uteskole* as a didactic method (Jordet, 1998, 2010), the grassroots movement of teachers using *uteskole* at the turn of the century and the subsequent focus on uteskole in physical education specialisation of teacher training, might have favoured a focus on physical education, and in particular skills and knowledge related to friluftsliv, in the practice of uteskole

2.1.3. Research on udeskole in Denmark

In the early 2000s, a case study of *udeskole* was conducted in Denmark, in which the researchers followed a primary school class practicing outdoor learning for three years (Mygind, 2005). The project was barrier breaking in the sense that it sought to empirically document the educational effects of *udeskole*. The research group explored how *udeskole* affected pupils' understanding and connection with nature, their well-being in school, their physical activities, their social interactions and their curriculum learning, with a particular emphasis on language. One of the main conclusions of the study was that the combination of outdoor and classroom learning activities contributes to strengthening opportunities to realise the collective *Bildung* aims, especially the health and social aspects (Mygind & Herholdt, 2005).

Barfod (2018a) describes that research interest in *udeskole* has increased in Denmark in the last decade through projects, such as the TrygFondens research project, TEACHOUT and several other projects aiding the development of *udeskole*. The Danish TEACHOUT project documented an increase in pupils' physical activities (Schneller et al., 2017), school motivation (Bølling et al., 2021; Bølling et al., 2019) and enhancement of academic skills (Otte et al., 2019). Barfod (2018b) finds that teachers see *udeskole* as a way of resisting the new public management trends influencing Danish schools. She also describes how *udeskole* in Denmark has developed from being a grassroots movement among teachers to a central component of educational policy and from singular occurrences to gaining nationwide prevalence (Barfod, 2018a). The prevalence of *udeskole* in Denmark was mapped twice in the last two decades, first, by Bentsen et al. (2010), and, second, by Barfod et al. (2016); it was found that approximately 15% of all Danish schools had one or several classes practising *udeskole* in 2007, whereas about 18.4% of all primary schools practised *udeskole* in 2013/2014. Barfod (2018a) also points to several other projects that have probably contributed to the increased prevalence and development of *udeskole* in Denmark, such as the establishment of the webpages www.*udeskole*.dk in 2000, www.skoven-i-skolen.dk in 2006 and the *Udeskole* Network [UdeskoleNet) in 2007.

2.1.4. Research on utomhuspedagogik in Sweden

While the terms *udeskole* and *uteskole* are used in Denmark and Norway, respectively, the term *utomhuspedagogik* [*outdoor pedagogy*] is the preferred word in in Sweden. According to Dahlgren and Szczespanski (1997), the foundation for *utomhuspedagogik* is the university environment around the University of Linköping. In the last 10 years, they have been exploring how learning outdoors affects pupils' mental health (Gustafsson, Szczepanski, Nelson, & Gustafsson, 2012), learning perspectives and attitudes towards outdoor learning (Fägerstam, 2014; Fägerstam & Blom, 2013). Another study of outdoor learning in Sweden was that by Wilhelmsson et al. (2012), in which it was found that teachers appreciate the opportunity to integrate theory and practice, facilitated by outdoor learning. They identify two *natures* of outdoor education among a group of Swedish teachers: one perspective in which the emphasis is on a holistic notion of the interaction between learning in the classroom and learning in an outdoor setting, and another perspective in which the outdoors is considered a source of practical and concrete knowledge, whereas the classroom is the source of theoretical knowledge. There has been no survey on the prevalence of *utomhuspedagogik* in Sweden, but the outdoors [utomhus] as a learning context is mentioned several times in the Swedish curriculum,

specifically in the subjects Sports and Health [Idrott och hälsa] and Natural Science and Technology [Naturvetenskap och Teknik] (Skolverket, 2018).

2.1.5. Definition of uteskole in this research project

In the present research project, I interviewed and observed teachers and pupils regularly working with curriculum-related learning activities both indoors and outdoors. I preferred to use *uteskole*, taking inspiration from Barfod's thesis in 2018, in which she describes *uteskole* as follows (Barfod, 2018a; Bentsen & Jensen, 2012; Jordet, 2010):

- It is an obligatory part of everyday life in school; it is not voluntary.
- It is conducted regularly, once a week or every other week, for a prolonged period of time; it is not one long trip (for example, a week-long excursion or trip).
- It takes place in the local community and neighbourhood of a school, in nature and in culture and community life, not always in particular environments that are far from the school.
- It is the homeroom-teacher who initiates and in general teaches in *uteskole*.
- The learning content is curriculum based, not programmes with other curricula, such as, for example, a climbing course.

My position as a researcher is within the Scandinavian context of *uteskole* but is also connected with the international field of experiential education, particularly those who critically investigate experiential education through the perspectives of John Dewey. This will be elaborated on in Chapter 3.

3. Theoretical perspectives

This research project is conducted within the theoretical framework of experiential education and pragmatist philosophy. In the following chapter, I first distinguish between experiential learning and experiential education. Second, I describe the different theoretical currents within experiential education. Third, I describe the relevant elements of pragmatist philosophy, particularly John Dewey's notions of experience and learning. Fourth, I elaborate on the didactic model of *uteskole* based on the work of Jordet (2010).

3.1. Distinguishing between experiential learning and experiential education

Experiential education is a broad and complex term. According to Jay Roberts (2012), author of the book *Beyond Learning by Doing – Theoretical Currents in Experiential Education*, 'there is little consensus on what, in fact, experiential education is' (p. 3). To establish a clearer understanding of experiential education, I start by distinguishing between experiential learning and experiential education. Both terms have been heavily discussed, so I only touch on the most central aspects without providing a complete overview of the discussions outside the scope of this narrative.

3.1.1. Experiential learning

Roberts (2012) suggests a distinction between experiential learning and experiential education and describes experiential learning as 'a method or technique that any teacher might employ to meet certain instructional objectives', whereas experiential education implies a broader process of 'individuation and socialisation'(p. 4). He exemplifies this distinction as follows:

> For example, an English teacher might help students learn rhyme and meter by asking them to 'dance out' a poem in iambic pentameter. This is certainly 'learning by doing' or the use of experiential learning in the moment. But it does not necessarily follow that using this method is the same as the process of experiential education as articulated by John Dewey (1938) and others. The two ask fundamentally different questions and work in different domains (p. 4).

This can be considered a quite broad distinction between the two, but I find that it provides a useful starting point for obtaining an overview of the differences between them.

Experiential learning has often been described or defined as *learning by doing*, but Hirsch (1996) suggests that this catchphrase is 'a phrase once used to characterize the progressivist movement but of little use today, possibly because the formulation has been the object of

much criticism and even ridicule' (p. 25). Seaman (2008) explains how the modern understanding of experiential learning is influenced by John Dewey's experimental method, Jean Piaget's constructivism and Kurt Hahn's humanistic ideals, along with some combination of behaviouristic and cognitive psychology, and that it was formalised as a model in the mid-20th century. The prototypical model was Kolb's (1984) experiential learning cycle, which consists of four phases: 1) concrete experience, 2) reflective observation, 3) abstract conceptualisation and 4) active experimentation. This model describes experiential learning as something that occurs when a learner has an experience, reflects on this experience and develops a conceptualisation of it that can be tested out through active experimentation.

Itin (1999) defines experiential learning as 'the change in an individual that results from reflection on a direct experience and results in new abstractions and applications. Experiential learning rests within the student and does not necessarily require a teacher' (p. 92). Seaman (2008) stresses that this definition of experiential learning remains remarkably enduring as a basic concept within outdoor and adventure education, if not all experiential education. However, he argues that this definition has resulted in a mechanistic, chronological understanding of the *experience, reflect, learn* learning cycle of experiential learning, consequently leading to a simplistic teaching practice. He suggests that this stepwise model inadequately explains the holistic learning processes that are central to learning from experience and concludes that this framework once had a useful purpose but that 'given changes in knowledge, research methods, participant populations, societal trends, and educational goals, it might now be influencing research and practice in unhelpful ways' (Seaman, 2008, p. 15). In *The Evolution of Experiential Learning Theory* by Seaman, Brown and Quay (2017) describe the evolution of experiential learning theory from 1946 to 2017. They highlight that the current trajectories of experiential learning theory, particularly within the field of outdoor education, indicate a departure from the basic model of experiential learning conceptualised by Kolb in the 1980s. They suggest that the publications by Paisley, Furman, Sibthorp, and Gookin (2008) and Schenck and Cruickshank (2015) offer better explanations for learning in experiential programmes and that these are consistent with efforts undertaken by Kolb himself (Kolb, 2014; Peterson, DeCato, & Kolb, 2015). Seaman et al. (2017) underline that although these two publications have different approaches, with the former focusing on external learning mechanisms and the latter taking a neurobiology approach, both emphasise experiential learning as a series of elements that interact over the course of action–reflection cycles to produce specific outcomes.

Despite the ongoing debate regarding how experiential learning is understood and which models provide helpful support for practitioners and researchers, according to Roberts (2012), they all describe experiential learning as 'a method or technique that any teacher might employ to meet certain instructional objectives' (p. 4). When the term *experiential learning* is defined in this manner, it indicates that it is something teachers use to support pupils' learning and thus begs the question of why it is not called *experiential teaching*. Nevertheless, the term *experiential learning* does not address philosophical questions about the aim of schooling and how we understand knowledge. For the purposes of this research project, I agree with Roberts' (2012) description of experiential learning as a *method* and with the modern holistic notion of how this learning process occurs, as described by Seaman et al. (2017).

3.1.2. Experiential education

Experiential education is also a fairly contested term. Richard Louv (2010), author of the book *Last Child in the Woods*, labels experiential education as 'the incipient movement of what is sometimes called experiential education' (p. 139). Itin (1999), on the other hand, suggests that experiential education should be regarded as *a philosophy*:

> Experiential education is a holistic philosophy where carefully chosen experiences supported by reflection, critical analysis, and synthesis, are structured to require the learner to take initiative, make decisions, and be accountable for the results, through actively posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, constructing meaning and integrating previously developed knowledge. (p. 93)

Roberts (2012) criticises the idea of experiential education as either a movement or a philosophy. He argues that the diversity within curriculum-based experiential education, ranging from adventure education to community-oriented schooling, means that there is no unified *movement* of experiential education. On the idea of considering experiential education as a philosophy, he argues that experiential education draws from a variety of philosophies and that there are no coherent epistemological, ethical or ontological assumptions.

Roberts (2012) states that experiential education implies a broader process of individuation and socialisation than the *method* of experiential learning and that experiential education should be regarded as *a field*. He outlines that there are common intellectual roots of the term, primarily 'the belief in the educative power of experience, of direct contact' (Roberts, 2012, p. 8). There are tensions and contradictions with the field, but when experiential education is regarded as a field, it provides the opportunity for a common space where 'questions are raised, answers [are] sought, and the overall inquiry is engaged' (Roberts, 2012, p. 7). I agree with

Roberts (2012) that experiential education should be regarded as a field and that it can be distinguished from the method of experiential learning.

3.1.3. Uteskole as part of the field of experiential education

The field of experiential education is very diverse (Roberts, 2012). Some projects use *nature and the outdoors* as the central focus, including outdoor education, challenge education and adventure education. The projects are often based on the ideas of historical figures, such as Kurt Hahn. Other projects focus more on the *experiential learning cycle* as a process, irrespective of context. The projects are often based on the ideas of early education progressives, such as John Dewey and, in more modern times, David Kolb, for example. There are also hybrids, such as place-based education and expeditionary learning, that draw from both traditions. *Uteskole* can be regarded as such a hybrid, focusing on both the experiential learning cycle and the oscillation between indoor and outdoor learning activities. In research on experiential education, *uteskole* seems to be categorised mainly as a sub-field of outdoor education (see, for example, Remmen and Iversen (2022). In the following, I draw on research from both the larger field of outdoor education and the sub-field of *uteskole*.

3.2. Theoretical currents in experiential education

I have described how experiential education can be regarded as a field; within this field, experiential learning is a model that can help account for the learning or teaching that occurs within the field. However, it is not the only model, and there are also other aspects or, as Roberts (2012) describes them, currents that are parts of the field of experiential education. He names the four main currents as the romantic, the critical, the normative and the pragmatist. In the following, I describe these currents and provide some examples of research on outdoor education and *uteskole* within these currents that are relevant to this research project.

3.2.1. The romantic current

Roberts (2012) states that in a romantic perspective, the central aim of education is ‘to provide opportunities to learn from experience before learning from labels’ (p. 39). Labels or representations are mediated by society, whereas experiences emerge from unmediated contact between the individual and the environment. The philosophical foundations for this perspective can be found in Jean Jacques Rousseau’s notions of an ideal educational process focusing on the free and natural development of the individual, avoiding the corrupting influences of society. As Rorty (1998) explains, ‘He is to learn from experience, by the consequences of his actions rather than from persons or books’ (p. 248). This current can be found in a variety of

schools, such as the free school and the democratic school, in which the curriculum is organised around student ownership of learning (Gray & Chanoff, 1986; Gray & Feldman, 2004). Roberts (2012) argues that teaching practices based on a romantic perspective of experience and learning represent a significant limitation in curriculum-based education. He underlines that from a romantic perspective, the idea of transformative potential in direct experiences can be disrupted by too much structure and discipline. The importance of avoiding the corrupting influences of society purports an educational practice in which an individual stands alone and is destined to make sense of experiences solely through their own previous experiences, resulting in the individualisation of the educational process.

Traces of the romantic current of experiential education can be found in research on outdoor education and *uteskole* in Nordic countries. Remmen and Iversen (2022) stress that Nordic countries seem to receive particular attention from the international research community because of the tradition of *friluftsliv*. As described in Chapter 2, this concept is founded on romantic ideals of the 18th century. This romantic notion of *friluftsliv* is also described in Scandinavian education research. For example, Goga, Guanio-Uluru, Hallås and Nyrnes (2018, p. 12) present *friluftsliv* as one of the main elements in their *nature in culture matrix* and characterise its celebratory position, which implies the idea of the *pure child* or a *child in nature,* as a key figure in Norwegian culture and pedagogy, indicating traces of the romantic current of experiential education.

3.2.2. The critical current

According to Roberts (2012), this current is perhaps the smallest within the field of experiential education. It is also the newest addition to the field, investigating phenomena, such as politics, power and social justice, within experiential education. As Roberts (2012) describes it, 'the political current views experience through the lens of power, either as a tool for reproducing inequalities or as a means for emancipation' (p. 69). The critical current is often regarded as a counter-current, running against the main currents of experiential education and instead suggesting aims and purposes of experience in education that are quite different from those that have been explored up to this point. The foundations for this can be found in theorists loosely connected with the Frankfurt School and with critical theory, such as Max Horkeimer, Herbert Marcuse and Theodor Adorno, who focused on the critique of positivism, mass culture, capitalism and the need for social change. Regarding education, critical theorists believe

that current school processes are designed to legitimate and reproduce the current unequal status quo. A central theorist in relation to the perspective of critical theory in education is Paulo Freire.

As Roberts (2012) states, the field of experiential education is, 'despite the best of intentions, a very white, privileged community' (p. 9). A good example of a study in outdoor education exploring this field through critical theory is Rose and Paisley's article entitled *White Privilege in Experiential Education: A Critical Reflection* (2012). In the Norwegian context, critical perspectives have also emerged in relation to teacher training programmes, in which some students in *friluftsliv* programmes request that their teachers make efforts and actively look for curriculum literature which can aid in the perspectivisation of what they describe as the dominance of White, Western, nationalistic literature in reading lists (Horgen, 2020).

3.2.3. The normative current

According to Roberts (2012), the normative current of experiential education concerns itself with the exploration of how ideas, such as market economies and the variation of rationalism, have normalised a particular notion of experience in education. One central aspect in this regard is what George Ritzer (2001) has coined as the *McDonaldization* of experience, in which society begins to take on the characteristics of the fast food company. Ritzer identifies four dimensions of McDonaldization: efficiency, calculability, predictability and control.

Regarding research on outdoor education, in his doctoral project, John Pierce (2020) explores how McDonaldization influences the practice of outdoor education in Ireland and leads to the irrationality of these outdoor educational programmes. In research on *uteskole*, a normative perspective can be found in the work of Barfod (2018b), in which it is described that Danish *udeskole* teachers see *udeskole* as a way to offer resistance to the idea of new public management that they believe is distorting their teaching practice.

3.2.4. The pragmatist current

According to Roberts (2012), the pragmatist current of experiential education is concerned with the exploration of how experience is constructed in pragmatist philosophy. The current uses pragmatist philosophical theories to explore experiential education, focusing on how experience is understood and how this understanding can support the development of models for experiential learning. There are a variety of curriculum projects within the pragmatist current of experiential education. Some focus on the importance and value of shared, interactive experiences, such as expeditionary learning, adventure learning and challenge education, often inspired by the work of Kurt Hahn and the Outward Bound movement. Other projects focus

on place-based education, in which learning activities are conducted in the community where the school is located. According to Roberts (2012), place-based education entails curriculum projects that focus on using the local community and environment as a starting point to teach concepts, support pupils in developing stronger ties to their community, enhance pupils' appreciation for the natural world and facilitate increased commitment to serving as active contributing citizens.

The place-based education approach is shaped by the different contexts in which it is practised. Beams and Ross (2010) describe a curriculum project from Scotland called *Journeys Outside the Classroom*, in which pupils explore their communities in small groups to collect answers to questions they have formulated and then report back to their class what they have learned. A similar project in Italy is reported by Bortolotti and Beams (2020). In the UK, *Learning in Natural Environments* is a curriculum project with similar characteristics (Dillon, 2013; Edwards-Jones, Waite, & Passy, 2018), but this programme does not entail visits to museums, businesses and activities in community institutions. In a publication by Waite et al. (2016), UK *forest schools*, or classes in nature for the youngest grades of primary school, are compared with the Danish *udeskole*. They find that the inductive- and pupil-centred pedagogical approach is the same in the two contexts. However, while *udeskole* is closely connected with the Danish curriculum and carried out by the pupils' homeroom teacher, in UK forest schools, 'the focus is not often on school subjects' (Waite et al., 2016, p. 876), and the activities are carried out by teachers or trained professionals working at the forest school rather than the pupils' homeroom teachers. Jordet's (2002, 2003, 2007) studies and his other publications (1998, 2009, 2010) regarding Norwegian *uteskole* are based on John Dewey's educational philosophy and can also be positioned as part of the pragmatist current of experiential education.

The research project that this narrative is describing is based on Jordet's (2010) didactic model of *uteskole*. Therefore, it is relevant to continue this chapter on the theoretical perspectives guiding this study in order to describe some central aspects of pragmatist philosophy that are relevant for this study. I then elaborate on Dewey's educational philosophy before I describe how Jordet has operationalised it into a didactic model of *uteskole*.

3.3. Pragmatism

Pragmatism can be defined as a school of thought that emerged primarily from the writings of three American thinkers: the natural scientist and philosopher Charles Sanders Peirce (1839–

1914), the psychologist and philosopher William James (1842–1919) and the philosopher, psychologist and educationalist John Dewey (1859–1952) (Bernstein, 2010; Biesta & Burbules, 2003). However, it should be stressed early on that there is not *one* pragmatism because pragmatists cover a wide range of philosophical topics, and there are important differences among their ideas. Bernstein (2010) likens the term *pragmatism* to an accordion, sometimes stretched to include a wide diversity of positions and thinkers and sometimes restricted to specific doctrines of the original American pragmatists.

Bernstein (2010) underlines that a unifying theme among all classical pragmatists and their successors is the development of a philosophical orientation that replaces Cartesianism. The three main pragmatists had a real anti-Cartesian opinion; they were against the scepticism that Descartes set up as a preoccupation for the tradition. In particular, the idea is that there is a gulf between what is before the mind, the realm of mere appearances, how things seem to be and how they may really be in the external world. According to Rorty (1982), pragmatists were against this idea intellectually and in a way ideologically because it reduced philosophy to a silly intellectual game, and philosophy should not be asking these sorts of questions.

A central aspect in this regard was the pragmatist critique of the traditional philosophical quest for absolute certainty. Rorty (1982) describes the quest to isolate something as true or good for pragmatists as indicating some sort of finality, 'that there is no interesting work to be done in this area' (p. 2). Pragmatists might consider certain acts to be *good* or *true* under circumstances, but they doubt that there is anything general and useful to say about what makes them all good or true. According to pragmatist philosophy, there is no fixed truth; we can only have partial knowledge, and what we know is constantly under revision (Roberts, 2012). This contextualised form of reason, which Roberts (2012) describes as *anti-foundationalism*, indicates that correct courses of action are discovered through experimentation in unique times and places. Pragmatists argue that formulating universal rules for action is not possible. As Dewey (1938) explains, 'it is a mistake to suppose that [the] 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' (p. 47). Similarly, Peirce (1992) argues that a central dogma of many varieties of modern philosophy is based on a Cartesian core and that breaking out of language or systems of signs and having direct, immediate knowledge of non-linguistic objects are possible. Scheffler (2011) summarises pragmatists' rejection of Cartesian thought, 'with its construal of knowledge as a mathematical structure

resting upon a foundation of certainty in the intuition of the individual mind, the mind itself understood as constituted of a substance utterly discrete from the physical world' (p. 8). However, pragmatists are not interested in solely critiquing Cartesianism but rather providing an alternative understanding of human beings and their place in the world. Thus, pragmatists argue for a recentring of the epistemological universe away from the mind and towards a relational orientation. Bernstein (2010) underlines that central to this shift of attention is the emphasis on the transactions that take place between human beings and their environments. As Dewey (1927) describes it, 'The old center was the mind … [t]he new center is indefinite interactions' (p. 232). In later writings, Dewey and Bentley (1949) use the term *transaction* instead of *interaction*. This is because transaction emphasises the process, whereas interaction suggests the existence of independent entities that engage with one another. I agree with Dewey's nuancing of the term, and, similar to Biesta and Burbules (2003), I use *transaction* as the preferred term in this narrative.

According to Bernstein (2010), pragmatist thinkers are heavily influenced by Darwin's evolutionary hypotheses, particularly in terms of how these provide a robust description of the relationship between human beings and the rest of nature. Scheffler (2011) claims that the idea influencing pragmatist thinkers the most is that of evolution 'forcing the consideration of a biological view of man's intelligence itself' (p. 5). Dewey (1909) has an ambivalent relationship with Darwinism. He agrees with the idea that we are engaged in evolutionary progress and that we are natural beings not radically separate from animals, but he is also sceptical of the nasty side of individualism and the notion of the survival of the fittest.

Pragmatists are deeply influenced by European philosophy, particularly the works of Immanuel Kant and Gustav Hegel (Biesta & Burbules, 2003). Kant suggested that an ultimate reality is inaccessible to us, and we must make do with a sufficiency of understanding rather than a totality. This has paved the way for pragmatists, although the way they interpret this and move it forward is quite a radical break from Kant. It is important to highlight that pragmatists do not argue that we should disregard theoretical knowledge; instead, they emphasise that, for example, laws of physics should not be understood as a direct correspondence between our minds' expression of these, through language and symbols, and the world, but rather as the best way we have formulated so far to deal with these kinds of problems. The pragmatist perspective would be that if we treat the world as if these things do exist, then we find that we can manipulate them and make things work much better. The point is that we cannot simply

choose anything. What is useful is not just on our whim to choose; rather, scientific theories is a useful way of looking at the world because it works much better than other ways.
Biesta and Burbules (2003) emphasise that although pragmatism is rooted in the Western philosophical tradition, it differs from it in one vital aspect: pragmatists argue that philosophy should consider the methods and insights of modern science. Biesta and Burbules suggest that the experimental nature of science, in which hypotheses are introduced, tested, reformulated and tested again, is the ideal metaphor for a pragmatist epistemology. As Roberts (2012) states, the term *experience* for pragmatists changes from being a noun to a verb: 'Experience is action. Or more to the point, it is trans-action' (p. 51). Consequently, a basic and defining characteristic of pragmatism is its keen interest in investigating things and gaining knowledge based on practical consequences.

3.4. John Dewey's educational philosophy

According to Scheffler (2011), Dewey was the giant of the pragmatists, both in general influence and breadth of scope. Dewey's writings cover an enormous range of areas, from traditional philosophy to the philosophy of science and the philosophy of education. His basic attitude towards philosophy is that its main role is not to solve the problems of philosophers but to deal with the problems of human beings. Consequently, he was also preoccupied with social concepts and the challenges of society, and he argued that the democratic process is central to solving these challenges.
Dewey was born in the US in 1859 and died in 1952 (Scheffler, 2011). During this period, the US transformed from a country of farms and small towns to a nation of factories, large cities and continental highways. Although technological advances resulted in positive developments in terms of economic stability, they also led to a focus on symbols and representations rather than first-hand experiences, and human beings became a cog in a larger machinery, a development clearly exemplified through Charlie Chaplin's film entitled *Modern Times*. These changes were not only social but also intellectual; they challenged traditional religion and concepts of personal and moral life and undermined classical philosophical conceptions of knowledge.
Before I elaborate further on Dewey's educational philosophy, it is important to be aware that Dewey developed his own understandings of many of the concepts often used within educational research, such as *education*, *philosophy* and *science* (Biesta & Burbules, 2003).

His main influence has been within the field of education. According to Dewey (1916), *education* should be regarded as the process of forming fundamental dispositions, intellectual and emotional, towards nature and humans. He regarded philosophy as a *general theory of education* that should support the development of intellectual and moral dispositions. In my opinion, this controversial viewpoint is one of the most fascinating ideas of Dewey, a clear statement of his pragmatist position that places education hierarchically above philosophy as a tool to support the education and development of human beings.

Similar to other pragmatists, Dewey was influenced by Gustav Hegel's notions on continuity, wholeness and the power of ideas, but he transformed the Hegelian emphasis on reason and spirit into an emphasis on scientific intelligence (Scheffler, 2011). He argues that it is science that transforms the world through a continuous revision of concepts of nature and practice, which provides new conditions for social life. Science also has moral implications because when human beings' capabilities increase, and they gain opportunities to change the environment, their moral responsibilities and the assessments of these changes' impacts might also increase. Dewey argues that science should be understood broadly, not only with physics or with the special procedures of the laboratory but rather as the operation of intelligence in its ideal form (Scheffler, 2011). *Philosophy* becomes a general theory for *education*, and *science* becomes the ideal process for acquiring knowledge. Dewey's fundamental position is thus inherently pragmatist; the disciplines that we human beings have developed, such as philosophy and science, support our efforts to deal with the problems we face rather than a 'quest for certainty' (Dewey, 1929a).

3.5. Dewey's concept of experience

As described in Section 3.3, pragmatists argue against a dualism between the minds of humans and reality. As Dewey (1929a) describes, 'We do not have to go to knowledge to obtain an exclusive hold on reality. The world as we experience it is the real world' (p. 235). Experience is a central concept in Dewey's educational philosophy and can be inferred from his books' titles, such as *Experience and Nature* (1925), *Art as Experience* (1934) and *Experience and Education* (1938). However, as Biesta and Burbules (2003) highlight, experience is also one of the most problematic concepts of Dewey's philosophy because it can easily be misunderstood and misinterpreted. In the following, I elaborate on Dewey's notion of experience. According to Scheffler (2011) and Biesta and Burbules (2003), Dewey's concept of experience is shaped by three elements. These are a) the biological emphasis on experience as a

product of the *transactions* between human beings and their environments, b) the *transactional approach* as a deliberate alternation of the environment by enquirers, leading to new knowledge, and c) the understanding of *meaning*, in which to attribute meanings to concepts, an individual must be able to apply these concepts to existence and experience the consequences.

3.5.1. Transaction

Dewey (1917) uses the word *experience* to refer to the product of the transactions of living organisms and their environments. These transactions entail active, adaptive and adjustive processes in which an organism seeks to maintain a dynamic balance with its ever-changing environment (Dewey, 1925). Biesta and Burbules (2003) claim that Dewey's philosophy can be seen as a critique of the *philosophy of consciousness*, the tradition assuming that the first reality of all philosophy is consciousness, leading to the question of how this disconnected consciousness can get in touch with reality. This question simply disappears in Dewey's understanding because it is assumed that we are constantly in transaction with the world. Contrary to the dualistic philosophy of consciousness, in which the immaterial mind and the material world are separated, Dewey argues that the human organism is always and already *in touch* with reality. A central aspect of Dewey's philosophy is that reality reveals itself as a result of the actions of the organism.

3.5.2. The transactional approach

To overcome what Dewey (Dewey & Bentley, 1949) describes as a false division between human beings and their environments, he suggests the use of a *transactional approach*. The aim of Dewey's transactional approach is to account for the point of contact between the human organism and its environment, and he believes that knowledge manifests itself, first, in the way human beings transact with and respond to the changes in their environments. Biesta and Burbules (2003) claim that Dewey's point is that human beings know that something reveals itself initially on the level of action and only later in symbolic forms (like language). Through transactions with their environments, human beings develop patterns of possible actions, which Dewey calls *habits* (Dewey & Bentley, 1949). This is basically a process of trial and error. According to Dewey (1925), habits are also the organic basis for meaning, which I will return to later in this chapter. However, habits are not the only way in which human beings can gain knowledge.

Dewey (Dewey & Bentley, 1949) argues that human beings can move beyond the process of trial and error through the use of symbols. By preforming symbolic operations, what Dewey

called *thinking*, human beings can try different lines of actions without being subjected to their consequences. This provides a foundation for human beings to consider possible lines of actions, but it is only when these are tested that we can know whether the suggested lines of actions are appropriate. Dewey (Dewey & Bentley, 1949) asserts that *knowledge* is a construction located in the organism's environment transaction itself. As Biesta and Burbules (2003) explain, 'What is constructed – over and over again – is the dynamic balance of [the] organism and [the] environment, which manifests itself both in the specific changes in the environment and specific changes in the patterns of action of the organism' (p. 9).

Dewey (1929b) argues that the essential ingredient in acquiring knowledge is the perception of *relationships*, especially those between our actions and their consequences. As our perceptions of these relationships develop, both our actions and the environment become more meaningful. To discover these relationships, we must experience and be able to remember what we have learned from such experiences. However, when we experience, we are not only passively perceiving a phenomenon, but we are also in deliberate transactions with the environment, and the consequences are registered and influence our future actions.

According to Dewey (Dewey & Bentley, 1949), the transactional approach, which emphasises the importance of trying out possible lines of actions, resembles modern scientific thinking. Consequently, *action* becomes essential to acquiring knowledge, *doing* is essential to *knowing*, and if an experience is going to be educative, it should, according to Dewey (1929b), be regarded as an experiment:

> The rudimentary prototype of experimental doing for the sake of knowing is found in ordinary procedures. When we are trying to make out the nature of a confused and unfamiliar object, we preform various acts with a view to establishing a new relationship to it, such as will bring to light qualities which will aid in understanding it. We turn it over, bring it into a better light, rattle and shake it, thump, push and press it, and so on. The object as it is experienced prior to the introduction of these changes baffles us; the intent of these acts is to make changes which will elicit some previously unperceived qualities, and by varying conditions of perception shake loose some property which as it stands blinds or misleads us. (p. 87)

Dewey's transactional approach clearly resembles the modern scientific method. Biesta and Burbules (2003) describe that his appreciation for the modern scientific method has led to some criticism, with some claiming that he was a positivist and others accusing him of scientism. However, Dewey (1929a) is clear that his appreciation for the method of the natural sciences 'would be misinterpreted if it were taken to mean that science is the only valid kind of knowledge' (p. 200). His point is that the scientific method has proven invaluable through its

practical successes in experimentation and problem solving, but it is not to be regarded as a privileged avenue to the truth in any fundamental sense.

3.5.3. Meaning

Dewey (1916) emphasises that to attribute meanings to concepts, an individual must be able to apply these concepts to existence and experience the consequences . He suggests that experience has *active* and *passive* phases:

> On the active hand, experience is trying – a meaning which is made explicit in the connected term experiment. On the passive, it is undergoing. When we experience something, we act upon it, we do something with it; then we suffer or undergo the consequences. We do something to the thing and then it does something to us in return: Such is the peculiar combination…. Experience as trying involves change, but change is a meaningless transition unless it is consciously connected with the return wave of consequences which flow from it. (p. 139)

Every experience entails *trying* and *undergoing*, referring to individuals' actions to manifest themselves upon the environment and vice versa. Ord and Leather (2011) elaborate on Dewey's notion of the active and passive phases of experience. They stress that the environment manifests itself upon individuals mainly as a reconceptualisation or change in how these individuals see the environment rather than as an actual physical change.

Dewey (1916) argues that 'Experience in itself is not primarily cognitive, the measure of the value of an experience lies in the perception of relationships or continuities to which it leads up' (p. 140). According to Dewey (1925), meaning is found in behaviour; it is the way in which human beings respond to the environment. As long as an individual has not found a way to respond to the environment, the meaning of the situation is unclear. Dewey's point is that the transactional approach, in which possible lines of actions are formulated and tested, not only leads to more specific habits but also results in a more differentiated, meaningful world. Individuals' responses become more specific, and, as a result, the environment to which they respond becomes more differentiated. Dewey (1916) states that human beings' abilities to discover these relationships vary and that all our experiences have an element of trial and error with them. Sometimes, we are uncertain about the relationship we have experienced, which might lead to a *rule-of-thumb* conclusion. On other occasions, we further develop our observations and analyses and begin to discover the relationships. Thinking becomes the intentional endeavour to discover specific connections between individuals' actions and the consequences of these actions so that the two become continuous (Dewey, 1916). This thoughtful action is different from our routines and habits. It enables human beings to take responsibility for their actions, and reflection is the acceptance of such a responsibility.

From my position in this field of theory and research, it seems that Dewey's concept of experience is shaped by three elements. These are a) the ontological position in which experience is regarded as the product of the transactions between human beings and their environments, b) the epistemological position in which knowledge is the product of the deliberate alternation of the environment by human beings, and c) the meaning that is established when human beings, through thoughtful action, transact with their environments, experience the consequences of their actions and take responsibility for these consequences.

3.6. Dewey's notion of educative experience

Dewey (1938) highlights two criteria for educative experiences: *transaction* and *continuity*. *Transaction,* as described above, refers to the interplay that occurs between human beings and their environments. Accordingly, the duty of the educator is to 'determine that environment which will interact with the existing capacities and needs of those taught to create a worthwhile experience' (Dewey, 1963, p. 45). *Continuity* means that every new experience incorporates elements from previous experiences and modifies the quality of later experiences. A consequence of the principle of continuity is that education should be defined as 'the reconstruction or reorganisation of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience' (Dewey, 1916, p. 16). Dewey's notion of educative experiences is central to the didactic model of *uteskole.* In the following section, I elaborate on this didactic model.

3.7. *Uteskole*, a didactic model based on Dewey's educational philosophy

Around the turn of the century, the Norwegian curriculum in primary and secondary education emphasised using the local community as a resource and context for learning activities in schools. From 1997 and in the subsequent curriculum revisions and reforms, the emphasis on the operationalisation of the curricula according to local circumstances and conditions led to an increased focus on *uteskole* through a grassroots movement of teachers, although the term was not explicitly mentioned in the curriculum. This focus on the curriculum led Norwegian education researcher Arne Jordet (2002, 2003, 2007) to conduct a seminal research project investigating how *uteskole* was practised at Lutvann Primary School. This work resulted in a didactic model for regular *uteskole* based on Dewey's pedagogical philosophy (Jordet, 2010).

The fundamental idea of *uteskole* is based on Dewey's notions of transaction and continuity (Jordet, 2010). Pupils transact with the world outside the classroom together with their classmates and teachers, while continuity is established between indoor and outdoor learning activities and between pupils' individual prior and current experiences and their collective experiences together with their peers and teachers. In line with Dewey's notion of educative experiences, Jordet (2010) claims that *uteskole* must attend to the principles of transaction and continuity in order to be educative. If the experiences are to be educative, it is teachers' responsibilities to make pupils consciously aware of their experiences and to acknowledge that what they are doing is connected with other curriculum elements they are working with. Jordet (2010) describes that when the principles of transaction and continuity are attended to, there will always be some element of prior knowledge and experiences that are carried on to the present situation, and at the same time, this also provides the foundation for future learning situations.

3.7.1. Transaction – Facilitating first-hand experiences for pupils and teachers

According to Jordet (2010), it is not sufficient to only build educational activities on pupils' experiences from everyday life. He argues that a central element in *uteskole* is that pupils and teachers are given opportunities to experience together and gain common experiences from the world outside of the classroom, and that these experiences can be used to support and enhance their educational efforts. By using the local environment and community to provide both pupils and teachers with common experiences, these experiences not only serve as the starting point for the learning process but also become an integrated part of pupils' education. Jordet (2010) suggests that regular *uteskole* will produce experience that both teachers and pupils can tap into in their daily work in the classroom.

Jordet (2010) states that the main problem of schools is that they takes their starting point from knowledge that lies outside of pupils' worlds of experience. According to Dewey (1915), the learning content becomes academic and theoretical: 'They are hieroglyphs which the pupil is required to study and learn while he is in school' (p. 73). Jordet (2010) indicates that the main challenge of schools is to identify material for education that lies within pupils' worlds of experience. He argues that pupils' experiences, not textbooks and representations, should provide the foundation for the education process.

3.7.2. Continuity between indoor and outdoor learning activities

Jordet (2010) argues that *text* and the *classroom* have monopolistic positions in traditional schooling as the sources of knowledge and the preferable contexts for teaching and learning. He claims that in pedagogical discussions, an artificial division has been created between theory and practice, between pupils' learning activities and teacher-led activities, and between learning activities within the classroom and learning activities outside of the classroom. These are not opposite positions but should be regarded, using Dewey's terminology, as *continuous*. Jordet (2010) argues that there is a fertile relationship between learning activities indoors and outdoors and suggests that if teachers establish an interplay between indoor and outdoor learning activities, then it forces them to think about the relationships in other areas of school, such as between theoretical and practical knowledge, between text and context, and between different approaches to teaching and learning, such as pupils' learning activities and teacher-led activities.

Jordet (2010) asserts that a didactic approach based on Dewey's educational philosophy must seek to facilitate an organic connection between theory and practice. This requires teachers to establish a close connection between the school's content knowledge and pupils' experiences. Jordet (2010) recognises that this is not an uncommon approach in schools today, but he claims that this is rarely conducted to the extent and systematics that Dewey described. He argues that the relationship between the school curriculum and pupils' experiences can be facilitated by establishing an interplay between the learning activities indoors and outdoors. Jordet points to the importance of establishing a relationship between pupils' experiences, the questions these activities give rise to and the accumulated wisdom of the world that is available in textbooks and other sources. This underlines the significance of the theoretical learning material, the text and, through this, the importance of reading, writing and talking in education. These are decisive skills in interpreting and expanding experience. He argues that the interplay between theory and practice in *uteskole* is two way. On the one hand, theory is brought outside, in which intellectual and academic terms and conceptualisations are applied to practical activities outdoors; on the other hand, the experiences outdoors are brought back indoors, giving *meat to the bone* and helping pupils establish a more elaborated and nuanced understanding of the theories they are working on indoors. Jordet (2010) claims that this is what Dewey meant when he talked about an organic understanding between theory and practice. Jordet (2010) highlights that pupils need help to understand and establish a connection between their experiences and a given learning material. Pupils' experiences must be analysed

through a process in which abstraction, generalisation and conceptualisation are central. For pupils' experiences in *uteskole* to become educative, such experiences must be connected with the different subjects' concepts, theories and models. Jordet underlines that a central challenge for *uteskole* is to design activities outside the classroom that can become integrated parts of a directed educational effort.

Jordet (2010) exemplifies this establishment of connections between indoor and outdoor, between theory and practice, in relation to establishing a campsite for *uteskole*. If a shelter is to be built, this work should be based on schematics prepared as part of the mathematics subject. When pupils are measuring and cutting planks in the right length and assembling them in the right angles, they need help to relate these activities to mathematical concepts, such as scaling, length, breadth, height, decimals, area, volume, diagonal and angles. There needs to be an interplay between the symbols of mathematics and the practical work on the building site, in which pupils have opportunities to use theoretical knowledge in practical action together with their classmates and teachers. In this way, they learn to use concepts and terms not only in practical operations outside of the classroom but also as part of a representational world of text and numbers within the boundaries of the classroom. It is important to clarify that this should not be regarded as a linear process in which pupils first learn theory indoors, then go outdoors and do something practical before returning to the classroom and documenting their learning. Instead, it should be understood as a cyclical process in which the emphasis is on the regular weekly oscillation between these two contexts and the opportunity to have repeated experiences both indoors and outdoors.

3.8. *Uteskole* in this research project

The theoretical perspective of this research project is positioned within an overarching experiential education framework. More precisely, it is positioned within the pragmatist current of experiential education and draws on Dewey's (1938) educational philosophy and the operationalisation of this philosophy into educational practice by Jordet (2010), resulting in the didactic model of *uteskole* presented above.

Jordet's (2010) didactic model provides a framework for how *uteskole* should be practised and may become a normative position. This gives opportunities to distinguish between practice that is in line with the didactic model of *uteskole* and practice that is not. However, it might also lead to blind spots, where I become so focused on how *uteskole* 'should' be practised that I fail to identify or ignore other important findings because they do not match the

norm. As described in Chapter 1, Section 1, as a teacher, I experienced a lack of a common language for distinguishing between different learning activities that were suitable for the outdoor context and those that were not.

In my opinion, Jordet's (2010) didactic model of *uteskole* does not provide sufficient descriptions to aid teachers in making this distinction. Furthermore, although he describes the cyclical, continuous process of indoor and outdoor learning activities, I find that the importance of moving beyond the temporal limitation of one *uteskole* day is not highlighted enough. *Uteskole* becomes something that occurs once a week, beginning with a class indoors, followed by a class outdoors, before returning to the classroom to document pupils' experiences. There is not enough emphasis on connecting the learning activities outdoors with classroom activities on other days of the week, which might lead to an understanding of *uteskole* as a weekly occurrence separate from the other school days. Jordet (2009) stresses that *uteskole* is not only a method but also an educational philosophy; he believes that *uteskole* should be seen as a practice that affects the other days of the school week as well. The integration of the experiences of *uteskole* into the other subjects in the school week is both an organisational and practical challenge, but it is something I feel is not emphasised enough in Jordet's (2010) didactic model. The point I am trying to make is that although Jordet's didactic model of *uteskole* provides the framework for this research project, there are still elements that can be developed and clarified. I hope that this project can contribute to such a development.

4. Methodology and research methods

In the previous chapter, the theoretical foundation for my PhD project was presented. According to Guba and Lincoln (1994), all theory is grounded in a worldview with ontological and epistemological foundations that guide the researcher regarding choices of methods. In this chapter, I account for the strategies of enquiry and methods used. Together, the worldview, the strategies of enquiry and the methods used contribute to the project's research design (Creswell, 2009). In Chapter 1, Section 1, I position myself as the researcher and indicate how this might affect this research project. Hopefully, this methods chapter and my positioning will enable readers to evaluate the credibility and sincerity of the knowledge produced in this research project.

4.1. Ontology

Pratt (2016) describes how Dewey's writings can be regarded as constituting the port of first call for a pragmatist social ontology: 'Mind and world are co-constituting' (p. 6). He argues that Dewey's notion of transaction makes it possible to 'escape the confines of Cartesian dualism by offering an anthropologically and practically grounded constructivist social ontology, in which consciousness, reality, experience, and innovation interact continuously and recursively' (p. 7). It is the perceived relationship between human beings' thoughtful actions and their environments that creates the meaning of an action or a phenomenon.

As described in Chapter 3, this PhD project is founded in an experiential education framework based on Dewey's pragmatist philosophy. Pragmatism does not propose a specific programme for the conduct of educational research, nor does it suggest any specific research methods (Biesta & Burbules, 2003). The element that distinguishes a pragmatist perspective from other ways of understanding educational research is its underlying transactional framework, which allows for an understanding of human interaction and communication in thoroughly practical terms. The present project is conducted using a *life-world approach*, while the theoretical perspective is based on pragmatist philosophy. The history of the concept of life-world dates back to the 1920s and 1930s and originates from Heidegger's (1927) exposition of being and the concept of *being-in-the-world*. The present research project explores teachers' and pupils' experiences with *uteskole* and particularly how they perceive and transact with their environments. According to Bernstein (2010), being-in-the-world is not an expression that any of the classical American pragmatists ever used, but it clearly articulates the

pragmatist understanding of the transactions that take place between human organisms and their environments. Some have argued that reading Heidegger through a pragmatist lens leads to a gross distortion, but Bernstein claims that there are commonalities between pragmatists and Heidegger, for example, in their critiques of traditional epistemology and metaphysics. A life-world approach requires that the researcher attempt to enter relevant phenomena in human existence by focusing on concrete real-life situations (Bengtsson, 2006) through a presupposition that such relevant phenomena manifest themselves in human life and that they might be investigated by focusing on human experience. In this project, the choice of a life-world approach is grounded in a desire to consider a transactional view of human beings and the world, in line with pragmatist theory.

4.2. Epistemology

The research approach in the present PhD project is founded on a holistic notion of learning, particularly influenced by pragmatist educational philosophy. A qualitative life-world research approach was chosen to investigate pupils' and teachers' experiences with *uteskole*, which implies that the subjects were studied in real-life situations. According to Gadamer (2010), investigating individuals' life-worlds implies meetings between different life-worlds: the informants' and the researcher's. Therefore, the aim is to facilitate favourable conditions for a *fusion of horizons*, establishing an understanding between the researcher's life-world and the informants' life-worlds by collecting qualitative material from the teachers' and pupils' everyday lives in school. Bengtsson (2006) argues that focusing on the world in its full concretion as it shows itself to the informant and establishing a possible platform for this fusion of horizons are important. I decided to conduct a three-month fieldwork with qualitative interviews, participatory observations and conversations with teachers and pupils during 15 *uteskole* days. Lived experiences and structures of meaning can be described and interpreted in infinite ways (van Manen, 1990). As underlined by Dewey (1916), every experience entails continuity between previous and current experiences, which also affects future experiences. A particular event in *uteskole* can never be regarded as fully objective or universal; it is always tied to the situation. This is reflected in what Roberts (2012) describes as pragmatist philosophy's contextualised form of reason or anti-foundationalism, indicating that correct courses of action are discovered through experimentation in unique times and places. Roberts states that when a pragmatist perspective is adopted, 'each unique problem must be addressed within an interactive, experimental context' (p. 52). Dewey (1938) argues that educative experience entails

transaction and continuity, and I found it relevant to try to describe and interpret teachers' and pupils' experiences related to these criteria in an attempt to explore some important aspects of how *uteskole* may contribute to deep learning. The distinction between transaction and continuity is also an analytical distinction, and in real situations, they cannot be separated from each other. However, a reduction of complexity is necessary because of a lack of access to the complete life-worlds of the informants.

Biesta and Burbules (2003) describe how pragmatism provides us with an alternative way of conceiving the relationships between knowledge and action. Knowledge may give us possibilities for refining and supporting our everyday problem solving but without a foolproof foundation for our actions. The differing contexts and situations involved mean that we can never be certain that a solution to a problem that is sufficient in one situation will be adequate in a different situation. Biesta and Burbules argue that this affects the research questions selected for a study. From a pragmatist perspective, the emphasis is not on formulating universal laws and rules for action but on investigating phenomena and describing them in relation to the current situation.

Following from this, pragmatism provides an alternative way to understand the objects of our knowledge. As Biesta and Burbules (2003) describe, 'Objects of knowledge are instruments for action, and different objects, different worlds, provide us with different opportunities and possibilities for action' (p. 108). This perspective influences the choice of research method, and they argue that multiple tools for enquiry should be used to gain different perspectives on the problems at hand. In the present research project, the use of systematic mapping review, participatory observations and qualitative interviews with teachers and pupils reflects this stance. Several data collection methods were applied in an attempt to answer the research questions. First, a systematic mapping review of previous research on deep learning spanning over nearly 50 years in primary and secondary schools was published. Second, a three-month fieldwork which included participatory observations of pupils and teachers in an *uteskole* setting was conducted. Third, qualitative interviews were conducted with samples of pupils and teachers, with a focus on their experiences of regular *uteskole*.

4.3. A systematic mapping review of deep learning

In current educational discourses, the focus is on changing education to provide children with the knowledge and skills they need to cope with the 21st century's demands, and deep learning is described as a key element to realise these goals. Unfortunately, the concept of deep

learning is given different definitions by researchers, policymakers, stakeholders, politicians, organisations and the media, leading to confusion about its meaning, applications and usage. Deep learning has become a generic term that covers a range of different component processes undertaken in different contexts for different aims (Dumont et al., 2010; Pellegrino & Hilton, 2012). When I was going to investigate teachers' and pupils' experiences with *uteskole* in primary education related to deep learning, ascertaining how deep learning is defined and conceptualised in the relevant research field of primary and secondary education was necessary. Together with my supervisor, Professor Knut Løndal, we designed a literature review to answer this question.

Grant and Booth (2009) present a typology of 14 different literature review types used within research and their associated methodologies. For our purposes, a *systematic mapping review* was most relevant aiming to 'map out and categorise existing literature from which to commission further reviews and/or primary research by identifying gaps in research literature' (Grant & Booth, 2009, p. 94).

This aligned well with our intention of creating a worldwide map of empirical research on deep learning in primary and secondary education and categorising studies according to their conceptualisation of deep learning. According to Grant and Booth (2009), the comprehensiveness of the search in a systematic mapping review is determined by time and scoping constraints, and this type of review does not entail a formal quality and methodological assessment of the publications, thus aligning well with the limited time and resources in the present research project.

The main research question guiding this systematic mapping review was as follows:

- *How is deep learning conceptualised and defined in research on primary and secondary education*?

4.3.1. Method of systematic mapping review

The method of this systematic mapping review draws on procedures defined in the literature on systematic literature reviews and research synthesis (Gough, Oliver, & Thomas, 2017; Grant & Booth, 2009; Moher et al., 2015). I developed a protocol for the present review using the *Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols* checklist (Moher et al., 2015), which involved planning and documenting every step of the review process before the actual review was conducted.

Search strategy

Because the term *deep learning* has become generic, and it proved challenging to ascertain which key terms to include in the search strings of the literature review, I examined a selection of central international and national grey literature publications within 21st-century education discourse, such as the OECD report *The Nature of Learning* (Dumont et al., 2010), the NRC report *Education for Life and Work* (Pellegrino & Hilton, 2012), the consensus report *How People Learn* (Bransford et al., 1999) and the two reports (NOU 2014:7, 2014; NOU 2015:8, 2015) published by the Norwegian Directorate for Teaching and Training. An initial search for research publications enabled the identification of several focus points and terms considered important for the definition of the core search terms. We decided to operationalise deep learning by including several variations of the term. Because of limited time and resources, we decided to use search terms in the English language only, and as this research project was conducted in the Norwegian education context, we examined the English version of the NOU 2015:8 (2015) and found that the preferred term was *in-depth learning*. We decided to include this term instead of the Norwegian term *dybdelæring*.

During the initial search, it was observed that some terms in the grey literature appeared to be closely connected with deep learning, such as *adaptive expertise* and *transfer of learning*, so we decided to incorporate them in the search string as well. With the help of a university librarian, who was a specialist in conducting searches for literature reviews, a search string was designed that included the following core search terms: deep learning, deeper learning, in-depth learning, *in depth learning, deep level processing, transfer of learning, adaptive expertise, 21st century skills, 21st century knowledge* and *21st century competencies* (see supplementary material of Article 1 for the detailed search documentation).

The university librarian ensured that the systematic search was conducted correctly. To ensure that all searches were conducted similarly across databases, we designed a second search string describing the educational levels of interest (see Supplementary Material in Article 1 for the search documentation). The search included text words from the title, subject descriptions, key words, and abstract and was conducted in the Education Resources Information Centre (ERIC), Education Source and Scopus databases. The first two databases are disciplinary topic-specific bibliographic databases focusing on education, while the third is interdisciplinary and enables the identification of key studies in other disciplines, as suggested by Gough et al. (2017).

The search was conducted in January 2018, and we decided on 1970 as the starting point because, according to Beattie et al. (1997), the only literature review published on deep learning, the terms *deep* and *surface* in relation to learning, was first described by Craik and Lockhart in 1972.

Inclusion and exclusion criteria

Table 1 shows a description of the inclusion and exclusion criteria used in the present study.

Table 1. Inclusion and exclusion criteria

Type of criterion	Criteria	Inclusion	Exclusion
Type of publication	Journal articles	X	
	Conference papers		X
	Reports		X
	Dissertations		X
	Books		X
Access	Online	X	
	Paper	X	
Publication period	January 1970–January 2018	X	
Place of study	Worldwide	X	
Type of study	Empirical investigation	X	
	Literature review	X	
	Theoretical study	X	
Research method	Qualitative	X	
	Quantitative	X	
	Mixed methods		
Language	English	X	
Educational level	Primary education	X	
	Secondary education	X	
	Special education		X
	Higher education		X
Key term in the title or abstract (topic)	Deep learning	X	
	Deep-level processing	X	
	Deeper learning	X	
	In-depth learning	X	
	In-depth learning	X	
	Adaptive expertise	X	
	Transfer of learning	X	
	21st century skills	X	
	21st century competencies	X	
	21st century knowledge	X	
Definition of the key term in the full text	Definition in the full text	X	
	No definition in the full text		X

The search resulted in 812 hits on ERIC, 614 hits on Education Source and 415 hits on Scopus, for a total of 1,841 publications (see Supplementary Material in Article 1). After the removal of duplicates, 1,303 publications were included in the first screening phase conducted at the publication *title* and *abstract* levels. As previously stated, we used search terms in the English language only, so an abstract in English was required to be considered for inclusion. Publications with abstracts in English but whose main text was written in a language that neither me nor Professor Løndal were proficient in would, if deemed eligible, be considered by a colleague proficient in that language. Because our focus was to investigate how deep learning was *conceptualised* within research in primary and secondary education, we had no re-

strictions regarding the study design or sample size when considering the eligibility of publications. However, studies with samples from either *special education* or *higher education* were excluded. Eligibility disagreements were resolved through discussions between me and Professor Løndal. As an initial calibration exercise, we first assessed 100 abstracts to pilot and refine the eligibility criteria before we conducted independent, blind screenings of all the publications' titles and abstracts against the inclusion criteria (Gough et al., 2017). Table 2 provides a description of the exclusion criteria used and the numbers of ineligible studies in the first screening.

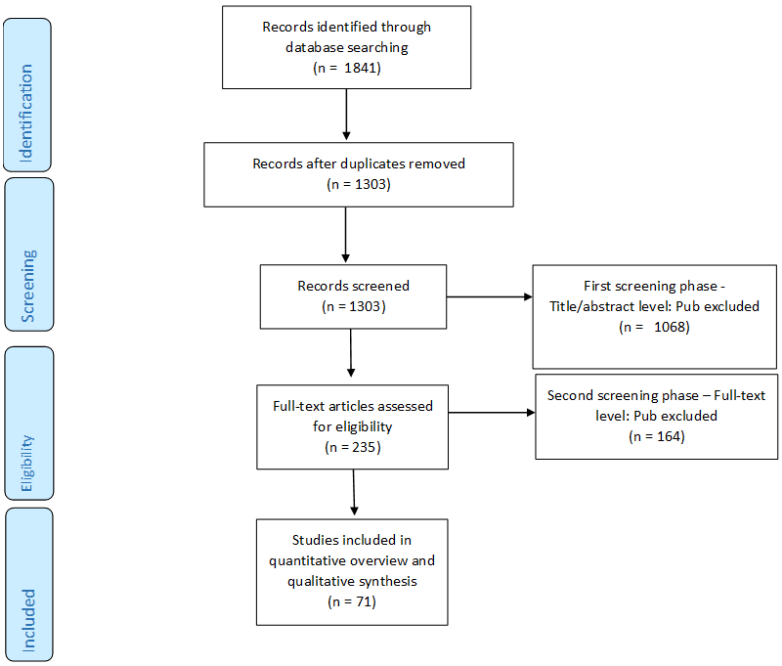
Table 2. Papers excluded in the first screening phase

Total number of publications	**1,303**
Not empirical	430
Not on topic	364
Not primary or secondary education	260
Not a journal article	14
Total excluded in the first screening phase	**1,068**
Publications eligible for the second screening phase	**235**

In the second screening phase, I read the full texts of the remaining 235 publications, focusing on identifying definitions and/or conceptualisations of the key terms in the publications (e.g. *deep learning*, *adaptive expertise*, and *21st century skills*) and possible connections between key terms and deep learning. Publications without definitions of deep learning or no descriptions of connections between the key term and deep learning were excluded. A manual search was also conducted in all 235 publications for any of the terms in the search string by using the *search* feature in Adobe Acrobat. This extra search confirmed that no terms were missed or overlooked in the initial full-text reading. In our preliminary search for relevant key terms, I read several central grey literature publications highlighting deep learning. Common to these publications were descriptions of connections or similarities between deep learning and terms such as *21st century skills*, *adaptive expertise* and *transfer of learning*. We identified only three studies examining 21st century skills/knowledge/competencies in the context of primary and secondary education and three studies examining adaptive expertise. This indicates that 21st century skills and adaptive expertise are more of educational policy terms than educational research terms in primary and secondary education. These six studies were read in full text, but none of them described a relationship between their key terms and deep learning, so they were excluded. We identified 60 studies examining the transfer of learning in primary and secondary education, but only three described a connection with deep learning and were

thus included. In the second screening phase, 164 publications were excluded. In total, we assessed 1,303 publications for eligibility in this review, and 71 were included. See Figure 1 for an overview of the stages of the eligibility assessment.

Figure 1. Flow diagram illustrating the stages of eligibility assessment



Data extraction and analysis

The analyses of the 71 eligible publications were performed in two steps, followed by discussions between me and Professor Løndal.

In the first step, a coding scheme inspired by the work of Gough et al. (2017) and Prøitz, Mausethagen and Skedsmo (2017) was applied to the included publications. The data were extracted, coded and categorised in QSR NVivo 12. The following descriptive variables were used in the coding: year of publication, first author's country of affiliation, age range of the participants, school subject and definitions of key terms.

In the second step, the extracted paragraphs defining and describing the study's definitions of deep learning and the possible connections with other terms were analysed to facilitate the qualitative identification and interpretation of patterns in the definitions. As suggested by Braun and Clarke (2006), we applied a conventional content analysis of the extracted definitions, avoiding the use of preconceived categories and instead relying on inductive categories with close similarity to the empirical material. As an example of the analysis, the following is a paragraph from Chin and Brown (2000):

> In essence, the deep approach is associated with intrinsic motivation and interest in the content of the task, a focus on understanding the meaning of the learning material, an attempt to relate parts to each other, new ideas to previous knowledge, and concepts to everyday experiences. (p. 110)

In this paragraph, we identified three main elements: intrinsic motivation, meaning and relating. The extracted paragraphs of all the included publications were analysed, synthesised and categorised in this way, providing an overview of the key elements in each definition.
The other descriptive variables, publication year, origin, age range and school subjects, were extracted and transferred to an Excel spreadsheet. This opened possibilities for exploring different patterns in relation to these variables.

Trustworthiness of the systematic mapping review

Because the purpose of this systematic mapping review was to identify and investigate peer-reviewed studies conducted within the context of primary and secondary education, it was not necessary to conduct an exhaustive search of all possible publications regarding deep learning. This limits the understanding of the phenomenon investigated, but it also provides clear parameters for other researchers to conduct an identical search. Because of the limited time and resources at our disposal, we also had to consider how we could conduct a study that would provide us with the information necessary to gain a sufficient understanding of previous research on primary and secondary education. It was important for us to test our knowledge claims through what Brinkmann and Kvale (2015) describe as *communicative validity*. Communicative validity refers to how the validation done by researchers, reviewers and educators of a study manages to explain and create new frameworks. Our claims were tested through both formal and informal conversations with research peers within and outside of our field of research in both national and international contexts.
The communicative validity of this systematic mapping review was also tested by presenting and discussing the review in various academic forums. The work was presented at a national research school (The Norwegian National Research School in Teacher Education), a PhD summer school (Outdoor and Environmental Education Research, 2017, at the Swedish School of Sport and Health Science), national conferences (Kroppsøvingskonferansen, 2018) and international conferences (European Educational Research Association conference, Bolzano, 2018). This systematic mapping was likewise presented and discussed in text seminars organised in my PhD programme (Oslo Metropolitan University) with senior and other PhD researcher peers, both from within and outside the field of education generally, as well as from the field of experiential education, outdoor education and *uteskole*. The conversations

were very stimulating, particularly in terms of providing a clear rationale for the study, differentiating and distinguishing between different conceptualisations of deep learning and describing the possible similarities and relationships between the conceptualisations. The systematic mapping review was also tested through several processes of a double-blind review. It was fruitful to discuss my research with people from outside academia, such as family, friends and former colleagues, which also contributed to its communicative validity.

4.4. Fieldwork – participatory observations and qualitative interviews

In this project, I was interested in both teachers' and pupils' experiences with *uteskole*, so this work is positioned within the field of human science. van Manen (1990) provides the following description of human science:

> Human science studies persons or beings that have consciousness and that act purposefully in and on the world by creating objects of meaning that are expressions of how human beings exist in the world. (p. 4)

Human science investigates themes such as human consciousness, human action and meaning making, and there are two main methods (quantitative and qualitative) that can be used to investigate, uncover and conceptualise this. As described above, I chose to investigate teachers' and pupils' experiences with *uteskole* through fieldwork consisting of participatory observations and qualitative interviews. *Uteskole* is a didactic method practised in different ways, and to gain a proper understanding of it, I added participatory observations to my data collection efforts to obtain a broader understanding of teachers' and pupils' experiences.

4.4.1. Participatory observation

According to Fangen (2010), participatory observation requires the researcher to be present in situations relevant to the study. The situation and context on which the observation is focused is often described as a *field*, and in this PhD project, the field of study is *uteskole*. The term *fieldwork* is often used as a synonym for participatory observation. The data material for this research project was gathered and recorded based on what the researchers saw, heard and experienced, along with the conversations with the informants during *uteskole* days. Participatory observation is normally conducted in smaller groups of people, and there are three main analytical elements in *uteskole*: the *teachers*, the *pupils* and the *environment* where *uteskole* is conducted (the setting). The setting in this PhD project was two schools in the eastern part of

Norway and the local area within walking or cycling distance from the schools. The concrete setting for the observations in this project changed based on where the teachers decided they would take the class. This turned out to be a quite large setting because the classes often travelled quite long distances by bike or on foot to the campsites that the teachers designated. A common characteristic across the different *uteskole* locations was that they were all forested semi-open areas with opportunities for bonfires. In line with Bengtsson (2006), the life-world approach adopted in this PhD project entails that the study be conducted in a natural setting. This is because the meaning of the teachers' and pupils' experiences of *uteskole* is closely connected with the environment in which their experiences take place. These experiences cannot be separated from the situation in which they were experienced. Robson (2002) highlights that participatory observations allow the researcher to gain knowledge that is not necessarily possible to articulate, remember or construct in an interview. Within this PhD project, the participatory observations of *uteskole* allowed for a description of some of the complexities and number of events that occurred during an *uteskole* session. Robson (2002) describes that by observing, the researcher gains knowledge on several levels, such as what is directly observed and the researcher's interpretation of being in the setting. Although the researcher can gain knowledge of the informants' actions and experiences in *uteskole* through an interview, it might not necessarily be an accurate reflection of the actions and experiences. According to Robson (2002), participatory observation can thus also function as a supplementary method and be used to confirm or debunk what the informants describe in an interview.

Fangen (2010) distinguishes between *structured* and *unstructured* observations. At the beginning of the observation, I used an observation guide with pre-determined categories (see Appendix, *attachment 1*). Gradually, I discovered that the pre-determined categories were not suitable; it felt like I was trying to fit my observations into an observation template that led to fractured and disorganised field notes instead of helping me organise my observations. Therefore, I decided to move to an unstructured observation, in which I described the day as it appeared to me. This gave me the opportunity to adapt and describe a narrative of the *uteskole* day that supported my memory and allowed for the easy incorporation of unforeseen incidents.

4.4.2. Qualitative interviews

According to van Manen (1990), children generally find it easier to *speak* about their experiences. They lack the necessary reflective attitude and have not mastered the linguistic demands of the writing process, which may constrict the freedom needed for life-world descriptions. Consequently, I chose to conduct qualitative interviews with both teachers and pupils. The teachers would probably be comfortable with expressing their own experiences through written descriptions, but the age range of the pupils (7–13 years) was an argument against using self-generated written descriptions.

According to Brinkmann and Kvale (2015), a qualitative research interview attempts to understand how informants see and experience the world prior to a scientific explanation by the researcher. In line with Dewey (1949), knowledge is constructed through a transaction between the researcher and the informant. In this research project, the teachers' and pupils' life-worlds and experiences with *uteskole* are the focus of the conversations. According to Robson (2002), the qualitative research interview provides a unique opportunity to gain access to and describe people's everyday life-worlds. The informants' experiences with *uteskole* comprise a complex field and require the interview to have a certain structure, but it is also important not to become too rigid. I therefore chose to use a semi-structured layout in the interviews, in which some overarching themes and questions provided the foundation for the conversation, and an interview guide was developed (see Appendix, *attachment 2,3,4* and *5*). A semi-structured life-world interview is used when events from the informants' everyday lives are understood through their own perspectives (Brinkmann & Kvale, 2015). The questions in the interview guide were formulated to elicit descriptions of the informants' life-worlds, particularly the meaning of the phenomenon they are describing (van Manen, 1990). I highlighted during the interviews that there were no right or wrong answers and that I was interested in the participants' experiences with regular *uteskole*. The semi-structured guide allowed for follow-up questions and comments that helped in understanding the complexity in the informants' experiences with *uteskole*. This structure gave me the opportunity to adapt the interview to the informant. For example, I could ask them if they remembered a situation that had occurred during an *uteskole* day or ask for their reflections on the actions they did or the activities they participated in during *uteskole*. This structure also required that I, as the researcher, must make decisions during the interview regarding what to follow up on and what to move on from. This means that the researcher becomes a research instrument (Brinkmann & Kvale, 2015). Consequently, I must have extensive knowledge of the subject at hand and the ability

to structure the conversation. At the same time, I needed to be friendly, emotionally supportive and open in order not to put hidden restrictions and restraint on the informants (Brinkmann & Kvale, 2015). This became particularly important because some of the informants were children (Alderson & Morrow, 2020).

4.4.3. Sampling and consent

Uteskole is practised in different ways, and I decided to include two schools in the study. The purpose is not to compare institutions but to gain a broad perspective and include a more diverse understanding of how *uteskole* is practised.

The prevalence of *uteskole* in Norway has not recently been mapped, so in line with Cohen and Arieli's (2011) suggestions, I used snowball sampling, utilising my network of teachers, principals and educational researchers to identify relevant schools. Within this sample of schools, I conducted strategic sampling (Robson, 2002). The main inclusion criterion was that the schools themselves are highlighting and promoting *uteskole* as a weekly feature and that it has been an established practice in the schools for at least the last five years. As described in Chapter 1, there is a knowledge gap regarding studies of deep learning that use samples from primary education. I therefore selected two primary schools (Schools 1 and 2) both located in the capital of Norway: one practising *uteskole* in the lower age ranges (first and second grades; pupils' age: 6–8 years) and the other practising *uteskole* in the higher age ranges (fifth to seventh grades; pupils' age: 10–13 years). I chose to include pupils in the second grade from School 1 because they already had one year of experience with *uteskole*, and I expected that they would be able to recall and articulate their experiences better than first graders would. Two teachers who always participated in *uteskole* were selected to join the study. I chose to include the pupils in the fifth to seventh grades in School 2 because of their way of organising *uteskole*, in which these three grades have *uteskole* at the same time; pupils work with fellow pupils from other grades during the learning activities. Each grade had two classes consisting of approximately 25 pupils. The fifth to seventh grades had *uteskole* weekly, and the three teachers who always participated in *uteskole* were included.

Three of the teachers, one from School 1 and two from School 2, have been practising *uteskole* for many years, whereas the other two, one from each school, have been practising it for only a few years. The teachers included in the study were homeroom teachers of the pupils included.

Thus, the combination of participatory observations and qualitative interviews made it possible to create a triangulation of the collected data (Robson, 2002): the pupils' experiences, the

teachers' experiences and my own observations of their *uteskole* learning, designed on a background of an extensive literature review of peer-reviewed publications of deep learning.
The study was conducted in line with the ethical guidelines provided by the Norwegian National Research Ethics Committees (NESH). Before data collection was initiated, the steps taken in this research project to secure informant confidentiality, the formulation of information given to the informants, the template for obtaining consent and the observation and interview guides were approved by the Norwegian Centre for Research Data (NSD) (see Appendix, *attachment 6* and *7*). After the research project was approved by the NSD, I carried out a risk assessment and established procedures for data processing, in line with Oslo Metropolitan University guidelines (Oslo Metropolitan University, 2022). This assessment considers three factors: confidentiality, integrity and accessibility. It is important to strike a good balance between the three value factors, and I used the template provided by Oslo Metropolitan University as a tool to assess the risks regarding data protection and processing.
I then requested and received formal consent from the administration at the two schools. The details of the data collection phase were agreed upon through a meeting with the school principals. Prior to the start of the study, I arranged two separate meetings in which I orally provided information about the project to the staff members and the children at the two schools. A letter containing the same information and a request for written consent concerning participation in the study was then sent to the pupils' guardians (see Appendix, *attachment 6*).
The teachers, the pupils and the pupils' guardians were given oral or written information about the project and were informed about the possible consequences of participation and their freedom to withdraw at any time during the data collection period. In line with Brinkmann and Kvale's (2015) suggestions, the pupils and the parents signed a written consent form upon participation. Consequently, the study was based on qualitative material gathered from 61 pupils, of which 24 were second graders (12 girls and 12 boys) and 37 were fifth to seventh graders (23 girls and 14 boys).

4.4.4. Data collection

As recommended by Brinkmann and Kvale (2015), I conducted preliminary visits during an *uteskole* day at each of the two schools to obtain an overview of how *uteskole* days were organised and to refine the structure and themes of the observation guide. At School 1, the data collection consisted of observations of pupils and teachers for six whole days, which included a combination of outdoor and classroom activities. At School 2, the pupils and teachers were observed for six whole outdoor days and three short days with classroom activities related to

the *uteskole* because, in contrast to the activities of School 1, those of School 2 were not carried out on the same day as the outdoor days were.

4.4.5. Participatory observation

In line with Merriam (2009), the informant group was followed during its regular routines, and field notes were taken of the teachers' activities and locations. These notes were taken continuously without pre-determined activity categories. Information was also collected through walk-along interviews and conversations with both pupils and teachers, and the field notes were rewritten into complete text files within two days. As a participatory observer, the researcher must capture the roles of the participants and the observer at the same time and retain a reflecting orientation without manipulating social situations and relations. It is crucial that the information gathered convey cogency related to the phenomenon and that relevant points contribute to the grasping of meaning related to the situation.

It was important that the observations generated information about the informants' experiences with *uteskole* related to Dewey's (1938) criteria for educative experiences (transaction and continuity). The observations were conducted when the pupils met in class before going outdoors, during their travelling to and from the *uteskole* locations and at the various *uteskole* locations. Sometimes, travelling to and from the *uteskole* locations was done on bicycles, but it mainly involved walking.

In line with Green and Hogan (2011), my role as a researcher was clarified to the children. They were informed that I did not have any pedagogical tasks and no responsibility to give orders or sanctions. Although I tried to appear as a participating interested adult during the observation sessions, as suggested by Green and Hogan (2011), my impression was that the pupils regarded me as something in between a teacher and an adult with a different role. Particularly, the younger pupils in the second grade contacted me and asked what they were meant to do or to which group they belonged, and I always referred them to their teachers. On the last days of observation at School 2, a teacher was absent, and the other teachers asked me whether I could cycle at the back of the group and ensure that the pupils stayed with the group. They explained that if I did not do this, they would not be able to carry out *uteskole* that day for security reasons. I explained that I could cycle behind the group but only if the teachers made it explicitly clear to the pupils that I should be regarded like a parent assisting the teachers on a trip. In fact, I often experienced when I was with the children that they acted against the rules of *uteskole*, but it seemed as though they trusted me not to tell the teachers.

This can be interpreted as an indication that they had come to terms with my role as a researcher rather than as a teacher.

4.4.6. The interviews

After the observation period was concluded, 10 pupils (five girls and five boys) and five teachers (one female and four males) were selected for the individual interviews. Before planning and conducting these interviews and selecting the participants, the field notes were closely reviewed and discussed with my supervisor. This allowed for the identification of particular situations or actions that I wanted the teachers and pupils to elaborate on. The interviews were structured and conducted as qualitative research interviews (Brinkmann & Kvale, 2015). The aims were 1) to provide depth to the situations and events that emerged during the observations and 2) to gather material directly related to the third, fourth and fifth research sub-questions in this project.

Among the pupils, both girls and boys from the two relevant age groups were selected because it was assumed that they would represent a variety of experiences. Prior to the interviews, interview guides (see Appendix, *attachment 2, 3, 4* and *5*) was prepared with a list of themes to be covered, together with suggestions for introducing questions and posing follow-up questions. After the interview guide with open-ended and explorative questions was developed, as suggested by Brinkmann and Kvale (2015), it was tested through a pilot interview with a colleague with extensive experience with *uteskole*, leading to the revision of questions with overlapping themes.

During the first interviews with the pupils, it became obvious that some on-the-spot revisions had to be made in order to adapt the interview to the second graders. Long questions were shortened, and a more focused emphasis was placed on connecting the questions with specific situations that the pupils could remember. This is in line with Eder and Fingerson's (2001) suggestion that interviews with children should be conducted as conversations revolving around places, situations or experiences that the children are already familiar with. In hindsight, I should have conducted a pilot interview to revise the interview guide with the pupils in the two age ranges (second, fifth, sixth and seventh grades); instead, I used my experiences with the first pupil interviews to do these revisions.

In line with method literature suggestions for interview contexts (Brinkmann & Kvale, 2015; Greene & Hogan, 2011; Robson, 2002), I chose to conduct the interviews in locations familiar to the pupils and the teachers. Younger pupils were interviewed in a classroom next to their

own, older pupils were interviewed in the school library, and the teachers were interviewed in the staffroom or at their own homes.

As suggested by Brinkmann and Kvale (2015) and Greene and Hogan (2011), I tried to stimulate my informants and make them reflect on their own experiences and thoughts related to the themes studied by giving the interviews the character of a one-on-one conversation. The qualitative material from interviews must be preserved, written down or sound recorded. As described by Brinkmann and Kvale (2015), two-way interviews require that the researcher must concentrate on the substance of the interviews and the dynamics of the conversations and secure details of conversations by using a sound recorder. Sound recording leaves out important non-verbal signals, such as gestures and other bodily expressions, but video recording would inhibit the informants and myself as well, and gives enormous amounts of information, and for the current study sound recording was considered sufficient. After the interviews were transcribed, I compared the sound recordings with the transcriptions and noted some details that the transcriber had omitted or overseen, such as tone of voice and laughter.

4.4.7. Transcription and analysis

In this project, I gathered and analysed qualitative material from the teachers' and pupils' experiences with regular *uteskole*. As the gathering process itself involved choices and reflections, the analysis process had already begun in the field. After the material was collected, the field notes and recordings were transcribed and prepared for *further* qualitative analysis. In line with Fangen (2010), this preparation entailed that I, on the back of the field notes, wrote a narrative describing the day in greater detail and elaborating on incidents and situations that I found particularly interesting. According to the life-world approach adopted in this research project, doing so is important. As van Manen (1990) states, the process in which field notes are transformed from keywords to a narrative often leads to a greater recollection of events than the summary rendition that the key words of the primary field notes suggest. After the field notes were prepared, the collected material comprised 50 pages of transcribed field notes from 15 observation days.

The interview material consisted of four and eight hours of sound recordings of the pupils' and teachers' interviews, respectively. While I prepared the field notes myself, a professional transcriber wrote the interviews verbatim. As recommended by Braun and Clarke (2006), I checked the interview transcripts against the audio files to ensure that meanings were captured. Structuring the material was the beginning of the analysis, and I tried to be conscious of my role as both the creator and interpreter of the text (Braun, Clarke, & Weate, 2016).

The analyses were inspired by the six-step model of thematic analyses by Braun et al. (2016) and should be considered a dynamic process that is continually shaped by the researcher's active choices. In the first step, the material from the observations and interviews was read several times with increasing thoroughness to obtain an overview. Interesting incidents and situations were marked, and ideas for coding began to be developed. As suggested by Braun and Clarke (2006), it was particularly important that I spent time familiarising myself with the material, as I did not transcribe the interviews myself.

The second step of the analyses began when I became familiar with the material and started to generate a tentative list of ideas regarding it. These ideas were formed into codes and then developed to further clarify and structure the material. The codes in this phase were mainly key phrases, such as 'relationship between indoor and outdoor' and 'first-hand experiences in outdoor learning activities'. As recommended by Braun and Clake (2006), I was particularly concerned with not excluding anything too soon. I therefore tried to give all the incidents or situations descriptive codes, and I kept some of the related data to ensure that the context of the incidents or situations was not lost. At the end of this phase, the material became more structured, and it gained some tentative codes.

In the third step, the coded extracts were analysed to look for ways to combine them into overarching themes. In this phase, I printed the extracts on paper, cut them into individual pieces of paper and played around with organising them in different piles. Gradually, some of the codes were developed into themes, such as *friluftsliv*, 'indoor activities outdoors' and 'activities in between'.

In the fourth step, the themes were reviewed. This phase consisted of two parts. In the first part, the extracts within a theme were read and reviewed to look for a coherent pattern. In this phase, it became clear that there were tensions within the themes, providing more nuanced descriptions of the phenomenon. For example, it emerged that learning activities related to *friluftsliv* were argued for by the teachers, both according to the pragmatist and romantic perspectives. In the second part of this step, the themes were reviewed in relation to the entire dataset. The aim of this part was to check that the analysis I conducted did not eschew the meaning of the dataset and that the themes reflected the meanings evident in the dataset as a whole. In this part, it was important for me to ensure that both the variety and the commonalities of the teachers' and pupils' experiences with *uteskole* were captured.

In the fifth step, the themes were defined and named. As Braun and Clarke (2006) suggest, one way of checking whether a researcher has properly defined and named a theme would be

to try to describe the scope and content of each theme in a couple of sentences. I found this to be a very helpful piece of advice, and it supported my efforts to make clearer distinctions between the different learning activities, particularly between those activities organised by the teachers and those that are not.

In the sixth and final step, the findings were structured and written into the research articles. The main task was to describe meaningful situations that could contribute to understanding the teachers' and pupils' experiences with regular *uteskole*. In line with Braun and Clarke (2006), the inductive interpretation of the identified themes was strongly linked to the data, whereas the theoretical interpretation was supported by relevant theory. As suggested by Braun et al. (2016), inductive interpretations were performed first, and a theoretical interpretation was conducted later with the use of theory to underline and support the inductive interpretations.

4.4.8. Trustworthiness

The quality of research is related to validity, reliability and generalisation (Brinkmann & Kvale, 2015). Some qualitative researchers argue that these concepts stem from oppressive positivist concepts that hamper creative and emancipatory qualitative research. Lincoln and Guba (1994) argue that the truth value of findings in qualitative research should be discussed according to ordinary language terms, such as trustworthiness, credibility, dependability and conformability. However, Brinkmann and Kvale (2015) assert that the traditional concepts of reliability and validity are terms in common language, and they instead suggest ascribing a meaning that is adapted to qualitative research. In the following, I chose to use traditional concepts adapted to qualitative research.

Reliability

Brinkmann and Kvale (2015) state that the reliability of research results depends on the trustworthiness and consistency of the study, as well as whether it is possible for the results to be reproduced by other researchers at other times. Within qualitative research, perhaps particularly within qualitative life-world interviews and participatory observation, reproducing previous research with the aim of generalising findings can be challenging and often impossible (van Manen, 1990). In line with the pragmatist theoretical foundation of this research project, the aim was not to generalise findings but to generate hypotheses and provide good examples of *uteskole* practice. Qualitative methods are less structured, observations are value based and context dependent, and the researcher uses themself as an instrument (Brinkmann & Kvale, 2015). As there are no fixed templates for gathering qualitative data, and no one else will have

the same experiences and background as the researcher, recreating the interpretations made within that context is challenging (Fangen, 2010).

However, Brinkmann and Kvale (2015) suggest that there are several steps one might take as a researcher to strengthen the reliability of a qualitative study. A detailed case description provides readers with the aims and purposes of the study and the methods used. The present research project's narrative can be regarded as a detailed case description. In the introduction to this narrative, the rationale for the study was described, and the research questions were operationalised. In the theory chapter, the research questions were put into context, relevant terms were defined, and the theoretical perspective was elaborated upon. In the methods chapter, the relationship between the research questions, the theoretical perspective and the method was argued and explained, and the data collection and analysis were described. In the results chapter, the findings are presented according to the three publications of this research project. In the discussion chapter, the findings are discussed and related to theoretical perspectives and previous research.

Brinkmann and Kvale (2015) emphasise that the observation and interview guide is also important for the reliability of a study. The observation guide used in the present study was structured after the different phases of the *uteskoledag* (see Appendix, *attachment 1*). During the fieldwork, I discovered that these phases did not necessarily reflect what was going on, so I adopted a more unstructured observation in which I focused on describing the day as it transpired. The questions in the interview guide were formulated in such a way that they did not lead the informant in any particular direction. As suggested by Brinkmann and Kvale (2015), leading questions were only used to check whether I understood the informants correctly.

The transcription of the data material might also impact the reliability of the study. The observations that I noted during the fieldwork and the subsequent writing of more elaborate field notes in the following days allowed for opportunities to reflect on what I observed and provide more detailed descriptions of my observations. The life-world approach and the focus on the informants' experiences indicate that the theoretical assumptions I brought to the observations in this project contributed to my identification or observation of events, which might not have been relevant to other researchers conducting similar fieldwork.

Regarding the interview material, I chose to use a professional transcriber. The material contained between 13 and 15 hours of recorded interviews with teachers and pupils, which is substantial material to transcribe to text. Therefore, I decided to use a professional transcriber to transcribe the material verbatim. As recommended by Braun and Clarke (2006), I listened to

the whole material later and compared it to the written transcription. This also gave me the opportunity to add more descriptive information, such as noting when the informants laughed, sounded excited or frustrated. The process of comparing the recordings to the transcribed text was important for me to gain familiarity with the material and also made it possible to make interpretations and inferences based on the additional information (Braun & Clarke, 2006).

The use of Braun et al.'s (2016) six-step model of thematic analyses contributed to a structured processing of the data material. In my description of the analysis earlier in this chapter, I tried to present how the material underwent thorough filtering and categorisation, making it possible to assess the results of the process. In the articles, we used excerpts from the observation and interview material to underpin our presentation of the material as reliable and valid—that the inferences were based on what we discovered in the material.

Validity

Validity in qualitative studies describes the degree to which the methods and findings reflect the aim of the study and represent reality (Brinkmann & Kvale, 2015). Validity is about looking for sources of errors and uncovering biases. There are two methods that can enhance the probability of qualitative research providing trustworthy results: continuous observation and triangulation (Robson, 2002). I used both methods in this project. The observations were carried out weekly over a period of three months, and I used triangulation by combining qualitative interviews with teachers and pupils with observation (Johnson, 1997). This provided me with three sources of information regarding teachers' and pupils' experiences with *uteskole*—the pupils, the teachers and my own—as it developed during the fieldwork. This provided three perspectives, all focusing on the teachers' and pupils' experiences with *uteskole*.

To enhance *informant validity* (Robson, 2002), I asked each of the teacher informants whether they wanted to read the transcriptions of their interviews, but they all declined. I chose not to ask the pupils whether they wanted to read the transcriptions because of the age of the youngest participants (seven years) and the amount of text involved (6–12 pages). However, I promised to return and present my findings to the pupils and teachers. This demonstrates my commitment as a researcher to present my findings in a conscientious way. None of the participants were given the opportunity to conduct a member check of their data after the translation of excerpts from the field notes and interviews into English for the purpose of publication of the findings in international journals.

Brinkmann and Kvale (2015) suggest that in order to enhance the reliability and validity of a study, the researcher should establish an audit system running as a clearly visible red thread

throughout the project. I believe that readers should be able to easily follow and assess the framework of the project, the aims, the theoretical perspectives, the methodology and choice of methods, the data and the data collection, the transcription and the analysis, as well as realise that this narrative keeps the elements of the study together.

Generalisation

In research methods literature, generalisation is often described as a quality where findings from one sample will be representative for other samples from the same population (Robson, 2002), in this case teachers and pupils in Norwegian uteskole. The aim of the present study, the method chosen and the limited sample of informants clearly communicate that the findings were not meant to be generalised according to this definition of generalisation. Furthermore, the pragmatist theoretical perspective signals an alternative understanding of generalisation. Although knowledge, from a pragmatist perspective, provides us with possibilities for refining and supporting our day-to-day problem solving, it does not provide a certain foundation for human action (Biesta & Burbules, 2003).

In order to explore teachers and pupils' experiences with *uteskole*, I chose a life-world approach with a particular emphasis on the transactional relationship between the informants and their surroundings, to identify and investigate some central elements in the informants' experiences (Bengtsson, 2006). The study contributes with insight into some general as well as central characteristics of their experiences. One may assume that these elements are found among teachers and pupils in other Norwegian schools practicing regular *uteskole*, which Brinkmann and Kvale (2015) describe as *analytic generalisation*. They state that analytical generalisation involves a reasoned judgment about the extent to which the findings of one study can be used as a guide for what might occur in another situation, based on analyses their similarities and differences. Detailed descriptions of the sampling, the data collection methods, the stepwise analyses, the presentation of results and elaboration of findings to established theoretical frameworks allow readers to judge the soundness of the generalisation claim.

4.4.10. Ethical considerations

This PhD project is historically and socially situated within the context of Norwegian primary education and, in line with all social research in Norway, follows the general ethical guidelines set by NESH. Our efforts to secure informant confidentiality, the information given to the informants, the template for obtaining consent and the observation and interview guides

were all approved by the NSD (see Appendix). As a PhD programme student at Oslo Metropolitan University, , the thesis comply with the ethical guidelines mandated by my institution (Oslo Metropolitan University, 2014).

In Norway, this type of research project requires the approval of the NSD based on a project description, an observation guide, an interview guide and a letter with the written information and the consent form that had to be signed by the informants (teachers and pupils) and the informants' guardians (pupils). Oslo Metropolitan University data security protocol regarding the storage of research material was followed. After approval by the NSD the two selected schools administration and the participants were informed about the projects main aims, the research design and methods, as well as the possible advantages and disadvantages of participating, as suggested by Brinkmann and Kvale (2015). I gave this information orally to the pupils and their teachers and gave them a letter with this information and a letter of consent (see Appendix, *attachment 6*). Since the pupils were not of age to give their consent alone, parents' or guardians consents were also obtained.

During the observations and fieldwork, data that could potentially identify the informants directly or indirectly were collected. To maintain confidentiality, all the participants were allocated fictitious names, which were used in both the transcriptions of the interviews and the field notes. The professional transcriber signed an agreement to preserve the informants' anonymity during the work. No characteristics regarding the informants' appearance or ethnic background were recorded and the schools' name and location are not disclosed. All data were securely stored according to the protocols of Oslo Metropolitan University and anonymised as required by the NSD.

4.4.11. Ethical principles when researching children's experiences

Hill (2011) outlines ethical considerations that must be considered when researching children's experiences and in this research project three of them were important to address: 1) consent and choice, 2) possible harm or distress and 3) privacy and confidentiality.

Consent and choice

Hill (2011) highlights that the main difference between children and adults as research informants relates to ability and power. The differences in terms of verbal competencies and abilities to understand abstract ideas require that the wording is adapted to the child's age and linguistic understanding. In this research project, this was relevant to consider when formulating the verbal information explaining the research project to be given to the pupils, when planning the written information to be provided to the pupils, when preparing the form on

which they, together with their guardians, were to give their consent to participate and when developing the interview guide. I emphasised the use of informal language and provided information about the research project as clearly and simply as possible. I also underlined that the children, at any time, could decline to answer my questions and withdraw from the study. In line with Hill's (2011) suggestion and NSDs approval, verbal and written information about the research project was given to the pupils first, and consent was obtained before the first day of observation. The pupils were informed about the potential benefits of the research not to them directly but to other children. Hill (2011) also recommends that pupils should give their positive consent to participate in a study and not simply fail to register dissent. I therefore required that the pupils themselves, in addition to their parents/guardians, gave their consent to join the project.

I realised when conducting the first interviews with the younger pupils that I had to make changes to the interview guide. Even though I had prepared a separate interview guide for the younger pupils (second graders) and attempted to formulate the questions in such a way that I considered their ages. These changes were mainly about simplifying the questions and not the content. I focused on using informal language and sitting at a level that was comfortable for the children to minimise my authority image (Hill, 2011). However, this was a balancing act because I also had to ensure that the interpersonal style I adopted did not overly reinforce the children's desire to please me as an adult; this would limit the amount, value and validity of what they will say.

Possible harm or distress

Hill (2011) highlights that in social research, there is rarely the potential for physical damage to the participants. However, emotional harm is a likely risk. Although there was no part of this project that involved upsetting the children, they may find being observed or asked questions by a researcher uncomfortable.

Privacy and confidentiality

As Hill (2011) articulates, it is commonplace in nearly all research that participants are promised that they will not be named or identified in any written or verbal report of the findings. In this research project, all the informants were given aliases, and I emphasised that no details that could distinguish them would be reported.

5. Findings

In this chapter, I summarise the three articles' main findings, points of discussion and arguments.

5.1. Article 1

Winje, Ø., & Løndal, K. (2020). Bringing deep learning to the surface: A systematic mapping review of 48 years of research in primary and secondary education. *Nordic Journal of Comparative and International Education (NJCIE), 4*(2), 25-41. doi:https://doi.org/10.7577/njcie.3798

This article provides an overview of the definitions of deep learning across 71 international studies on primary and secondary education from 1970 to 2018. We extracted the definitions used and synthesised, compared and thematised them to provide an overview of the key elements in the definitions and the learning theories and perspectives applied. We also described in which parts of the world research on deep learning has been conducted, along with the school subjects and age ranges examined.

In the analysis, we find that there are two main conceptualisations of deep learning: *meaningful learning* and *transfer of learning*. The first is conceptualised as students' approach to learning with the intention to understand the meaning of the learning material and to relate new ideas to previous knowledge, driven by an intrinsic motivation to learn. The other is conceptualised as students' abilities to transfer knowledge and skills to novel contexts. Deep learning has been investigated in Asia (35 studies), Europe (22), North America (10), Oceania (8), Africa (2) and South America (1). The age range of the participants in the studies reviewed was 8 to 23 years, and the mean age ranged from 13 to 16 years. The studies focused on the school subjects of science (23 studies), languages (15) or mathematics (13), often in combination, whereas 19 publications focused on students' learning approaches or motivation for schoolwork independent of the school subject. Social science (8), computer science (4), art (2), vocational subjects (1) and religion (1) were examined by some publications.

Based on these findings, we first discuss the different conceptualisations of deep learning and argue that the emphasis on cognitive aspects is not sufficient if it is going to account for pupils' learning in primary and secondary education. We suggest that future studies of deep learning should consider the embodied, affective, social and cognitive aspects of learning. Second, we discuss how these conceptualisations of deep learning are interpreted in various ways across different socio-cultural contexts and argue that future studies should consider

how *understanding* is understood across different cultures and in the transfer and adaptation of research findings regarding deep learning across varying educational systems. Third, we discuss the school subjects incorporated into studies of deep learning. We stress the lack of emphasis on practical aesthetic subjects (PAS) and suggest that PAS should be included in future research regarding deep learning to ensure a more holistic understanding of the interactions between the embodied, affective, social and cognitive aspects of learning. Fourth, we discuss the lack of studies of deep learning in the lower age ranges of primary education and argue that this issue needs to be addressed in order to adapt the concept of deep learning to general compulsory education.

5.2. Article 2

Winje, Ø., & Løndal, K. (2021). Theoretical and practical, but rarely integrated: Norwegian primary school teachers' intentions and practices of teaching outside the classroom. *Journal of Outdoor and Environmental Education, 24*, 133-150. doi:https://doi.org/10.1007/s42322-021-00082-x

This article explores teachers' intentions and practices related to teaching outside the classroom. The data material was collected through a three-month fieldwork consisting of 15 days of participatory observations and qualitative interviews with five teachers in two Norwegian primary schools practising regular *uteskole*. The data were analysed through a combination of inductive and theoretical interpretations. Several theoretical perspectives relevant to experiential education, such as the romantic and pragmatist notions of experience and education, were used to highlight and support the inductive interpretations.

In the analysis, we find that the teachers' goal with *uteskole* is to facilitate first-hand experiences for their pupils, and that they teach and organise *uteskole* in two ways: 1) *friluftsliv* activities [outdoor living activities] and 2) theoretical learning activities. The connections between *friluftsliv* activities and theoretical learning activities are seldom emphasised, and the teachers rarely organise theoretical learning activities that require pupils' interactions with their surroundings.

Based on these findings, we first discuss how the teachers' practices can be understood through the romantic and pragmatist perspectives of experiential education and through the representational epistemology of traditional schooling. Second, we outline how a transactional epistemology, operationalised as the *multi-modal model of knowing*, can support teachers in

facilitating transactions between pupils and the environment outdoors, as well as aid in establishing continuity between learning activities outdoors and indoors. We argue that facilitating transactions and continuity can enhance *uteskole* as a teaching method for facilitating deep learning in Norwegian primary education.

We conclude that in their aim to facilitate their pupils' first-hand experiences of the environment outside the classroom, the teachers encounter difficulties in linking experiences in *uteskole* with the curriculum content. The multiple epistemologies embedded in and that influence the teachers' practices seem to be the main obstacles to taking advantage of the possibilities in the didactic model of *uteskole*. For *uteskole* to more consistently contribute to Norwegian schools' commitment to deep learning, teacher training programmes should focus on learning about different epistemological positions and how these might influence and guide the practice of *uteskole*. There is a need for further studies of teachers' intentions and practices related to *uteskole* that critically apply its foundational philosophical framework.

5.3. Article 3

Winje, Ø., & Løndal, K. (2021). 'Wow! is that a birch leaf? In the picture it looked totally different': a pragmatist perspective on deep learning in Norwegian 'uteskole'. *Education 3-13*, 1-14. doi:https://doi.org/10.1080/03004279.2021.1955946

This article investigates primary school pupils' experiences with learning outside the classroom and explores how these experiences might contribute to deep learning. The data material was collected through a three-month fieldwork consisting of 15 days of participatory observations and qualitative interviews with 10 pupils aged 7–12 years. These pupils attended two Norwegian primary schools practising regular *uteskole*. The data were examined through a combination of inductive and theoretical interpretations, in which theory was used to underline and support the inductive interpretations. Pragmatist theoretical perspectives, particularly John Dewey's notions of transaction and continuity, along with a situated perspective of knowledge, and Nicol's (2003) multi-modal model of knowing, were used to highlight and support the inductive interpretations.

In the analysis, we find that two central themes emerged in relation to the pupils' experiences with *uteskole*: 1) movement in and across varied terrains, which emphasises the pupils' experiences moving in a variety of contexts on their way to, from and at the locations, and 2) organised outdoor learning activities, which represent the pupils' experiences with the learning activities organised by the teachers at the *uteskole* location.

Based on these findings, we first discuss learning activities related to the school subjects of science and physical education and describe how these activities reflect transaction and continuity on the basis of John Dewey's notion of experience. We argue that these learning activities also entail all aspects of Nicol's (2003) multi-modal model of knowing and that the pupils in the two schools experience learning activities that may facilitate deep learning regarding the two subject themes. Second, we discuss the *in-between* activities, which are informal learning situations that occur during the transportation phase and during the pupils' free time at the *uteskole* locations, where the pupils transact with their surroundings; we observe that there seems to be a lack of focus from teachers on establishing continuity between informal and formal learning activities. We argue that there is considerably higher potential for developing pupils' movement experiences in *uteskole* in line with the curricular aims of deep learning, but there is a need to organise learning activities in *uteskole* to provide more opportunities for the teachers to support the pupils' development. Third, we discuss learning activities based on the manipulation of symbols and representations, in which the pupils participate in learning activities outdoors that mainly require manipulating symbols and representations. We argue that 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 with the context, for example, when pupils are tasked with solving rebus puzzles and taking quizzes about Norwegian inventors or the royal family. We assert that these representational learning activities are not designed to facilitate transactions between the pupils and the context and seem to be regarded by the teachers as knowledge that could be learned regardless of context. Furthermore, we argue that although the pupils learn something by being outdoors and transacting with the outdoor environment, there is no continuity between indoor and outdoor learning when the activities are essentially the same outdoors as they are indoors. We assert that the pupils might learn to manipulate symbols and representations and communicate these 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 conclude that there is potential for facilitating deep learning in *uteskole*, but there should be an increased emphasis on establishing transactions and continuity and on incorporating other subject themes by alternating between diverse contexts to allow for the integration of a wider variety of subject themes. These findings should be considered when designing teacher

education programmes focusing on *uteskole*. There is also a need for studies that investigate *uteskole* while critically applying the foundational pragmatist framework.

6. Discussion

The overall aim of this project is to contribute to an overview of how deep learning is conceptualised within research on primary and secondary education and to explore how deep learning can be understood within an experiential education framework, incorporating the embodied, affective and emotional aspects of learning, in addition to the cognitive perspectives on which the concept is commonly based. I also wish to contribute to the knowledge of how *uteskole* is practised in Norway and raise questions that can further its development.

The main research question guiding this project is as follows:

> *How is deep learning understood in previous educational research, and how can uteskole be practised to facilitate deep learning processes?*

This overarching question is divided into five research sub-questions that frame my discussion:

1. How is deep learning conceptualised and defined in research on primary and secondary education?
2. How can the conceptualisations of deep learning be understood within a pragmatist/ experiential education framework?
3. What are Norwegian teachers' intentions in practising regular *uteskole*?
4. What activities and strategies do teachers utilise when practising *uteskole*?
5. How do primary school pupils experience regular *uteskole*, and how is deep learning reflected in these experiences?

Sub-questions 1 and 2 mainly relate to the conceptualisation of deep learning and how it can be understood within an experiential education framework. Sub-questions 3 and 4 relate to the teachers' intentions with and their practice of *uteskole*, whereas sub-question 5 relates to the pupils' experiences with regular *uteskole* and whether these experiences indicate learning activities that facilitate deep learning processes.

6.1. Conceptualisations of deep learning

The project started with an emphasis on deep learning as a prominent feature in Norwegian education discourse (NOU 2014:7, 2014; NOU 2015:8, 2015). I observed that there was a multitude of descriptions, definitions and conceptualisations both within national (The Norwegian Directorate for Education and Training, 2020) and international (Dumont et al., 2010; Pellegrino & Hilton, 2012) discourses. To establish a foundation for this research project, a systematic mapping review of deep learning in primary and secondary education was conducted to gain an overview of the different understandings of the term 'deep learning' (Winje & Løndal, 2020). I found two main conceptualisations: deep learning as *meaningful learning*

and deep learning as *transfer of learning*. Meaningful learning is conceptualised as students' approach to learning with the intentions to understand the meaning of the learning material, to relate new ideas to previous knowledge, and driven by an intrinsic motivation to learn. Transfer of learning is conceptualised as students' abilities to transfer knowledge and skills to novel contexts. I found it difficult to identify and establish a connection between the two conceptualisations, for example, whether meaningful learning is a prerequisite for the subsequent transfer of learning.

Our findings in Article 1 confirm that in research on primary and secondary education, deep learning is investigated with a focus on cognitive perspectives, studied among informants aged 13 to 16 years, and examined mainly in relation to the school subjects of languages, mathematics and science. There is a lack of studies on deep learning that apply a holistic understanding of learning focussing on pupils in younger ages and in practical aesthetic school subjects.

Some scholars (Dahl & Østern, 2019; Lindholm, 2021; Tochon, 2010) argue that a too narrow research scope might result in a limited understanding of learning mainly as *cognitive learning* among politicians, policymakers, school leaders, teachers, students and parents, which might thus favour teaching practice based solely on this narrow understanding. Dahl and Østern (2019) and Lindholm (2021) argue that current conceptualisations of deep learning particularly lack an embodied dimension and that the absence of the body as a significant factor indicates an inherent and traditional Cartesian split between body and mind. Lindholm (2021) describes how this division means that we are cut off from understanding how cognition develops as a mentalisation of embodied, perceptive and emotional experiences; he suggests that *bodies* are 'enormous pools of biographic conditional experiential knowledge, where everything you have experienced, practised, acted on and learned is embedded into every cell' [p. 187; my translation]. Lindholm (2021) claims that we become everything that our bodies have been shaped to be through practice, skills, muscle memory, neural networks and learning of fine motor skills. This statement is in line with recent developments in neuroscience, which find that learning is a process that fundamentally involves embodied, affective, social and cognitive aspects. Examples are Damasio's (1994, 2000, 2012) studies on the connections between emotions and rationality (somatic marker hypothesis), Kandel's (2006) research on the physiological basis of memory storage in neurons (synaptic growth) and Rizzolatti and Singaglia's (2008) study of the connections between perception, memory and action

(mirror neurons). Consequently, these aspects should all be considered of value in presentations and investigations of deep learning in the context of primary and secondary education. Experiential education is, as described in Chapter 1, an approach that might be used to develop an understanding of deep learning that includes all these aspects. As a response to this call for broadening deep learning perspectives, I discuss in the following how deep learning can be conceptualised within an experiential education framework and, subsequently, how it can be used to investigate teachers' and pupils' experiences with *uteskole*.

The conceptualisations of deep learning that we found in Article 1 are insufficient to understand teachers' and pupils' experiences with *uteskole*, as they lack a holistic understanding of the embodied, social, affective and cognitive aspects central to experiential education. A theoretical framework must be established to analyse and understand teachers' and pupils' experiences with *uteskole* as related to deep learning. I elaborate on my argument for how, meaningful learning and transfer of learning, can be understood within an experiential education framework based on pragmatist philosophy. I then discuss how these two conceptualisations can be identified and combined through Nicol's (2003) multi-modal model of knowing.

6.2. Deep learning conceptualised within an experiential education framework

How do we explore concepts developed within the field of cognitive learning theory, in neighbouring fields? If we take a step back and look at these conceptualisations more broadly, we can argue that they point to two central challenges which almost all education research fields attempt to explore: Making pupils understand what we are trying to teach them, and stimulating them to use what they have learned in a novel context outside of school. These questions are fundamental to most education endeavours (Bransford et al., 1999; National Academies of Sciences et al., 2018). They might be regarded as connected, and I suggest that there are important relationships between the two, according to an experiential education framework.

6.2.1. Meaning making

Central pragmatist thinkers, such as Charles Sanders Peirce and John Dewey, highlight that for an individual to be able to attribute meanings to concepts, they must be given opportunities to apply these concepts to their current environments and to experience the consequences and perceive the relationships between their actions and their consequences (Biesta & Burbules, 2003). A key idea within pragmatist philosophy is that these transactions, their consequences and their relationships provide the basis for the meaning-making process. Dewey

(1938) asserts that how we perceive the relationships between actions and consequences is essential to acquiring knowledge. As our perceptions of these relationships develop, both actions and the environment become more meaningful, but are dependent on memory. According to Osberg, Biesta and Cilliers (2008), when schools are established as separate educational worlds, an increased emphasis on the representations of the environment outside of schools occurs. Pupils are assembled in a classroom, unable to transact with the environment outside, which favours the focus on making theoretical assumptions about what the consequences of a given action would be rather than actually experiencing them themselves. Dewey (1920) underscores that perceiving a phenomenon is not a passive process, as every transaction is a reciprocal relationship. Building on Dewey, Ord and Leather (2011) describe this double relationship as *trying* and *undergoing*. Using previous experiences as the basis, we try by acting and undergo the consequences of our actions. Sometimes, one might say that consequences are immediate responses from our environment to our actions, but these responses may also erupt as changes in our perceptions of the environments. Operationalised in a school setting, these perspectives might entail that pupils should be given opportunities to test their understanding by using their knowledge and skills to solve problems in authentic real-life situations in order to understand or make meaning out of something.

In Article 2 (Winje & Løndal, 2021a), we find that all the teachers in our study describe their main intention for *uteskole* as providing opportunities for their pupils to gain first-hand experiences in what the teachers call *real life*. This is also stressed by Jordet (2010) in his didactic model for *uteskole*. As Annie, teacher at School 1, explains:

> I believe that the most important part is being able to relate it to real-life and first-hand experiences. It is not just something they are going to sit and read about; they can touch things, smell them and get a feel for them. (Winje & Løndal, 2021a, p. 141)

The teachers' intentions to facilitate first-hand experiences for the pupils resembles pragmatists' description of the significance of transactions in the meaning-making process. An excerpt from the field notes quoted in Article 3 (Winje & Løndal, 2021b), provides an example of how these transactions in *uteskole* allow for opportunities for the pupils to experience the consequences of their actions:

> 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'. (p. 7)

This exemplify what Dewey describes as the double relationship in all transactions and what Ord and Leather (2011) characterise as trying and undergoing. The pupils try out their cycling skills and must undergo the consequences of their actions. These consequences do not necessarily have to be physical responses, for example, falling off their bikes; they can also be changes in how the pupils perceive their environments and their own skills. An example of more subtle trying and undergoing is described in the following excerpt from the field notes quoted in Article 3 (Winje & Løndal, 2021b):

> We are walking along 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 are making snowballs and putting 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. (p. 6)

The pupils continually try and undergo during their *uteskole* day, and the multitude and availability of materials to transact provide numerous possibilities to experience the double relationships.

Ord and Leather (2011) suggest that Dewey's notion of continuity is also central in this meaning-making process, both in the participants' prior experiences and in their understanding of how prior and current experiences might impact their future experiences. Our findings in Article 2 (Winje & Løndal, 2021a) indicate that the *uteskole* teachers understand and value the importance of establishing continuity between learning activities indoors and outdoors, as George, teacher at School 1 describes:

> You can sit in a classroom and learn about birds by watching movies or drawing. However, the idea is to do it inside first and then go out and watch and listen to the birds. Unfortunately, they cannot touch a bird, but they are not far from it; they are studying it. Then, we return to the classroom, and they can capture their experiences on a piece of paper. In this way, they enhance their learning. (p. 141)

This is an example of the teachers' intentions to establish continuity between learning activities indoors and outdoors, and is also in line with Jordets (2010) didactic model of *uteskole*. Lindholm's (2021) description of bodies as enormous pools of biographic conditional experiential knowledge, and the pragmatist perspective of trying and undergoing in the meaning-making process, strongly underline that our embodied experience of the environment and our

continuous efforts to understand by trying and undergoing are both central to how we establish meaning. Pupils need to be given opportunities to use their bodies to transact with their environments and to experience the consequences of their actions in order to facilitate meaningful learning processes according to a pragmatist perspective. As our findings in Articles 2 and 3 indicate (Winje & Løndal, 2021a, 2021b), the teachers have serious intentions to facilitate such meaning-making situations, creating ample opportunities for pupils to transact with their local environments and experience the consequences of their actions.

6.2.2. Transfer of learning

Traditional schooling is generally based on the cognitive perspective of the transfer of learning, in which knowledge is a package of information that can be transferred from one context to another (Brown, 2010). As Osberg et al. (2008) underscore, when traditional schooling was established, the school became a separate educational world for children, prompting the need to represent real life within the confines of school. Under these conditions, real life is presented through the use of *representations*, a second-order expression of reality. Biesta and Burbules (2003) describe this understanding of knowledge as a representational epistemology, in which what is presented in education stands for something else *out there*. In practice, this means that pupils learn something in the classroom, and it is presumed that they can find and recognise situations outside of school where they can use this knowledge.

A central aspect of pragmatist philosophy is the critique of the traditional quest for absolute certainty. Pragmatist philosophy rejects the idea that absolute certainty exists in representations and that universal laws or templates can be used to solve problems regardless of the situation (Roberts, 2012). According to pragmatism, knowledge comprises constructions located in the organism–environment transaction itself (Dewey & Bentley, 1949), and it is the dynamic balance of the organism and the environment that is continuously re-constructed. This is manifested both in specific changes in the environment and specific changes in the organism's patterns of actions. Building on Dewey's notion of knowledge as constructions located in the organism–environment transaction, Biesta (2010) suggests a transactional epistemology, highlighting that the knowledge we gain through experimentation is knowledge about the relationships between our actions and their consequences. These relationships provide us with hypotheses for problem solving, but there will always be a gap between our knowledge and new situations. This leads to a different understanding of the transfer of learning than purported by the traditional cognitive perspective. Pragmatist philosophy suggests a contextual-

ised form of reason in which suitable courses of action are discovered through experimentation in unique times and places. This is in direct conflict with the traditional idea that it is possible to formulate general rules for action that can simply be transferred to novel situations (Roberts, 2012).

The traditional notion of transfer is also criticised by Brown (2010), underlining that problem solving and human cognitive practices are not simply internalised mental processes; they are always performed in conjunction with the setting. He suggests that this situated perspective of transfer of learning forces us to regard knowledge not as a package of information that can be moved between various contexts but as regular patterns in our transactions with other people, material and representational systems. Thus, making pupils familiar with problem solving in a range of different situations and enabling them to identify the particular aspects of a situation that might indicate how their knowledge can be used to solve problems are important. Brown's (2010) argument suggests that pupils should be given opportunities to experience and transact in a range of situations, both indoors and outdoors, in educational settings. The concept of transfer of learning is a key element in the definition of deep learning in the Norwegian national curriculum (The Norwegian Directorate for Education and Training, 2020). However, there are no clear suggestions that classes should be held regularly in contexts other than the classroom and that timetables should be rearranged to facilitate such opportunities. Our findings in Article 3 (Winje & Løndal, 2021b) indicate that *uteskole*, as a regular weekly change of context, might be a useful and important support to facilitate deep learning, which is considered central in the curriculum. Fifth-grader Clara, explains the difference between the knowledge she acquires in the classroom and that she obtains outdoors in *uteskole*:

> When we are outdoors, we can see how things are in real life. It's harder to learn about leaves when you're indoors than when you're outdoors. When you're outdoors, you can just find them in the forest, and in pictures, they don't 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'. (p. 7)

Clara stresses how the outdoor context makes it possible for her to refine the knowledge she has acquired in the classroom and connect it with the actual phenomenon outdoors. The change of context also allows for actually trying out their knowledge in other contexts, as seventh-grader Judy, describes:

> In the classroom, we learn a lot of theory. Now and then, we also have one class in which we learn about things connected with being outdoors. When we're outdoors, we practise actual practical stuff, for example, how to dress properly and how to use axes

> and knives. These are things you must do to learn. It's more fun because you can actually try it out in the real world. (p. 8)

Judy underlines that *uteskole* sometimes allows her to establish a connection between the classroom and the outdoors and opportunity to acquire practical knowledge. Although the teachers have serious intentions to provide their pupils with opportunities to solve problems and experience things in outdoor contexts, we also find that they only succeed in doing so in relation to some school subjects, mainly science and physical education. As suggested in Article 3, this might be because these subjects are easier to connect directly with the context in which the teachers choose to conduct the learning activities. A forested setting makes connection with these two subjects more obvious. If they opt to conduct *uteskole* at a museum, at a local factory or in a sculpture park, then other subjects would certainly be more relevant.

6.2.3. Operationalisation of deep learning

I have attempted to use the conceptualisations of deep learning identified in our systematic mapping review to explore how they might appear within the field of experiential education. In other words, I am trying to move the concepts of deep learning from the field of cognitive learning theory to the field of experiential education. Experiential education is, as described in Chapter 3, heavily influenced by pragmatist philosophy, particularly the works of Dewey. To conceptualise meaningful learning and transfer of learning more in line with an experiential education framework, I discuss how these concepts can be understood within pragmatist philosophy on the basis of the findings in Articles 2 and 3 (Winje & Løndal, 2021a, 2021b).
In the following, I suggest operationalising the deep learning concepts of meaningful learning and transfer of learning through Nicol's (2003) model of knowing. Building on Heron's (1996) and Reason's (1998) four-point epistemology, he relates this model to outdoor education, particularly to how it might contribute to environmental education and distinguishes between *experiential*, *presentational*, *propositional* and *practical* ways of knowing.

Experiential knowing

Experiential knowing is knowing through direct first-hand experiences of a person, place or thing; it is tacit and pre-verbal (Nicol, 2003). He underlines that experiential knowing is based on the assumption that there is no good way to separate the mind from its ecological and emotional context, to separate feeling from knowledge, or object from subject. Similar to the emphasis of pragmatist philosophy on transaction, experiential knowing reflects an epistemological position which unifies the subject and object, the mind and world. Learning becomes an 'interactive relationship between the educator, the learner, and the natural environment'

(Nicol, 2003, p. 18). This is in line with Dewey's notion of *knowledge* as constructions located in the organism–environment transaction itself (Dewey & Bentley, 1949). According to Nicol (2003), outdoor education has the potential to contribute to experiential knowing because it moves beyond the physical confines of classroom-based education and the abstract distinctions between subject disciplines and into the natural environment. This is in accordance with Jordet's (Jordet, 2010) suggestions for *uteskole*, in which pupils can gain relevant experiences in the natural environment that enhance their learning of curricular knowledge. In Article 2 (Winje & Løndal, 2021a), we find experiential knowing in the teachers' intentions for *uteskole* to provide first-hand experiences to their pupils. The findings in Article 3 (Winje & Løndal, 2021b) reveal situations in *uteskole* that stimulate the pupils' experiential knowing when they are free to engage with their surroundings and transact with the outdoor environment using all their senses.

Nicol (2003) argues that if experiential knowing relies on the direct experience of the natural environment, then there is a need for means to identify the quality of experiences. Citing Dewey, Nicol (2003, p. 19) states that there is a distinction between *experience* and *education*, and it is relevant to suggest that this argument can be connected with Dewey's criteria for educative experience, transaction and continuity. Nicol highlights that direct experience is only the beginning of the learning process and foundational before introducing pupils to more advanced levels of knowledge. He stresses the role of the teacher because experiential knowing in itself gives no guidance as to the quality of the experience. This is similar to the distinction between the romantic and pragmatist notions of learning and knowledge. The romantic notion would emphasise the importance of not corrupting pupils' experiences through teachers' meddling and attempts to connect their experiences with culture; pragmatists would argue that that is exactly the essence of developing knowledge—connecting experiences with culture. According to Nicol (2003) experiential knowing is the most basic form of knowledge; the next step is a more advanced form, presentational knowing.

Presentational knowing

Presentational knowing is manifest in images that articulate experiential knowing, for example, art, music, dance, poetry and drama (Nicol, 2003). Nicol argues that this form of knowing allows learners to reflect on their experiences, and enables experiences to become a unification of the mind and the world as the learners' attempts to internalise such experiences through talk, text or image. This involves a conscious effort from the learner and is the phase

in which teachers' roles become apparent—to support pupils' exploration of the representations of their experiences. This is similar to Dewey's (Dewey & Bentley, 1949) notion of thinking, in which the initial experience is reflected upon, processed and developed. Nicol (2003) emphasises that these representations of the experience (text, talk or image) are not solely rational. Similar to Dahl and Østern's (2019) and Lindholm's (2021) arguments for including the embodied, affective and social aspects of learning in the understanding of deep learning, Nicol (2003) stresses the importance of not considering presentational knowing as cognitive processing only but that embodied and affective aspects are important parts of this process. Presentational knowing is the most basic way of making sense of our experiences, similar to Dewey's (1938) notion of the importance of processing experiences. Jordet (2010) highlights that this processing can be supported by the use of an *uteskole* book in which pupils may express their experiences through drawing and writing. In our study, we find presentational knowing in the pupils' use of drawing in the *uteskole* book and in the collective reflection sessions (Winje & Løndal, 2021b). Nicol's (2003) model further asserts that children need to learn how to control their own thinking by projecting beyond the context of the immediate world through propositional knowing.

Propositional knowing

Propositional knowing is knowing *about* something in intellectual terms of ideas and theories and is expressed in abstract language, symbols or mathematics (Nicol, 2003). It allows pupils to explore the world beyond their experiential and presentational knowing. Through propositional knowing, they can critically evaluate texts, propositions and theories, looking for strengths and weaknesses and developing their own theories. This kind of knowing relies heavily on the ability to express and understand knowledge through language. Furthermore, propositional knowing has clear similarities with Dewey's notion of the importance of processing experiences, particularly his notion of thinking and the ability to formulate hypotheses and express suggested relationships between actions and consequences (Dewey & Bentley, 1949). Nicol (2003) describes how this multi-modal epistemology supports learners in developing constructs to make sense of meaning by organising their experiences into categories. He argues that this process works in two directions. First, the direct experiences are codified, and second, the theoretical knowledge is structured and ordered in a manner that accommodates new experiences. This description resembles Dewey's (1938) notion of continuity, in which individuals' prior and present experiences are organised and provide the foundation for future

experiences. Jordet (2010) also stresses the importance of establishing continuity both between pupils' prior and current experiences and between outdoor learning activities and classroom activities. We can find examples of propositional knowing in our articles. For example, it is apparent in the findings in Article 3, such as the emphasis on learning about the categories of birds (migrating/non-migrating) and trees (School 1) and the focus on understanding maps, weather forecasts and which fabric to wear according to the forecast (School 2) (Winje & Løndal, 2021b).

While the processes of experiential, presentational and propositional knowing all contribute to the elaboration and understanding of an experience, there also needs to be an element in which this experience is put into practice and action. This is the fourth form of knowing—practical knowing.

Practical knowing

Practical knowing involves how to do something, expressed as a skill, knack or competence (Nicol, 2003). He emphasises the importance of distinguishing between activity as a willingness to participate for the outcomes inherent in that activity and activity as a conscious decision to act. As Nicol (2003) states, 'action should therefore not be confused with being physically active in outdoor activities' (p. 21). Practical knowing is not related to being physically active, but 'you take actions in line with your beliefs and based on your knowledge of a given situation' (p. 23). Similarly, Dewey (1916) underlines that when an individual becomes aware of the relationship between actions and consequences, it leads to a moral responsibility to act accordingly. In relation to *uteskole* this is significant particularly because Lauterbach and colleagues' preliminary results indicate that the majority of schools in Norway with regular uteskole, incorporate friluftsliv as a central element (G. Lauterbach, personal communication, April 12, 2022), and Jordet's (2010) warnings about *uteskole* being reduced to *friluftsliv* activities. Therefore, practical knowing in *uteskole* should not mainly be related to developing a skill or technique but to being able to act according to the experiential, presentational and propositional knowing that one has acquired. Nicol (2003) describes how deep (ecological) awareness may be realised through this model of knowing. Similarly, Dewey (1938) stresses that although action is the realisation of the processing of an experience, it is also the beginning of the process all over again, of new experiences which are reflected upon and processed, developing the experience further, may become the foundation for subsequent actions. This continuous revision is in line with the pragmatist idea of anti-foundationalism (Roberts,

2012), accentuating that the knowledge developed through this process cannot be regarded as universal rules for action.

Jordet (2010) highlights the importance of pupils being able to test their understanding through problem solving in the outdoor context; he states that actions outdoors are not the end points but parts of a continuous sequence of experiential learning. Pupils must be given opportunities to reflect on, revise and re-test their actions through weekly regular *uteskole*. Our findings in Article 2 indicate that despite the teachers' intentions to establish continuity in their *uteskole* practice, this is severely challenged by organisational, financial and scheduling issues (Winje & Løndal, 2021a). In Article 3, we found that the pupils had opportunities to try out their understanding in relation to the school subjects of physical education and science, in which they prepared bird food and identified trees using templates; in School 2, they had opportunities to ride a bicycle, use maps and light bonfires (Winje & Løndal, 2021b). As will be elaborated on later in this chapter, there are unused potentials for facilitating deep learning activities in *uteskole* in terms of not only being physically active but also being active in the sense that may contribute to deep learning through experiential, presentational and propositional knowing.

Nicol's (2003) multi-modal model of knowing allows for the inclusion of both meaningful learning and transfer of learning according to a pragmatist understanding of deep learning. I also suggest that these four ways of knowing, taken together, provide a broader, more precise, more inclusive and more coherent notion of deep learning, incorporating the embodied, affective, social and cognitive aspects of learning. Using examples from Articles 2 and 3, I attempted to show how *uteskole* can facilitate these four forms of knowing.

6.3. Teachers' intentions and practises

In Articles 2 and 3, we find that *uteskole* in Norway cannot be regarded as one coherent approach but that it entails the interplay of at least three different practices (Winje & Løndal, 2021a, 2021b). In the following, I present and discuss these three *uteskole* practices identified through our fieldwork: 1) *uteskole as friluftsliv*, 2) *uteskole as indoor learning activities outdoors* and 3) *uteskole as an integrated practice*. I also describe their interplay and how they might contribute to deep learning. This is an important distinction because these three practices have central characteristics that span across distinctive epistemological perspectives (romantic, traditional and pragmatist) on how to define knowledge and how it is acquired; as a

result, there is confusion regarding their contributions to our understanding of deep learning, according to an experiential education framework.

6.3.1. Three practices of Norwegian uteskole

In Article 2, we identified two distinct *uteskole* practices: *uteskole as friluftsliv* and *uteskole as theoretical learning activities* (Winje & Løndal, 2021a). We also saw traces of a third practice, an integrated practice in which the teachers organise learning activities aiming to integrate and apply knowledge acquired in the classroom to authentic situations outdoors. In Article 3, this third integrated practice became clearer, particularly in relation to the subjects of physical education and science (Winje & Løndal, 2021b).

Based on the findings in Articles 2 and 3, I elaborate on the three practices of *uteskole* and discuss their interplay and how they might contribute to facilitating deep learning. I decided to change the naming of one of the practices from Article 2 to this narrative, from *theoretical learning activities* to *indoor learning activities outdoors*, because it gives a clearer description of its characteristics. I want to underscore that although I distinguish between these three types of *uteskole* practices, they might all be present during one *uteskole* day. This should be regarded as an analytical distinction to make it easier to describe different aspects of *uteskole*, allowing for a more nuanced perspective of the teachers' practices.

6.3.2. Uteskole as friluftsliv

In Articles 2 and 3, we find that when the teachers often organise learning activities related to *friluftsliv*, the pupils experience the goals accordingly as skills training in walking, hiking, skiing or bicycling to the *uteskole* location, and by participating in different camp activities involving bonfires; using tools relevant to *friluftsliv*, such as saws, axes and knives, and engage in free play in nature (Winje & Løndal, 2021a, 2021b).

This finding is in line with research on *uteskole* and outdoor education in Norway. Lauterbach and colleagues (G. Lauterbach, personal communication, April 12, 2022) preliminary results indicate that the majority of schools with regular uteskole, incorporate *friluftsliv* as a central element. Abelsen and Leirhaug (2017) report that 50% of 14 studies about *friluftsliv* in primary and secondary education in Norway are related to *uteskole*. Similarly, Remmen and Iversen's review (2022) confirms that both *uteskole* and *friluftsliv* are central aspects of outdoor education in Nordic countries and refer to *the Nordic outdoor culture*, indicating its national and cultural heritage. The emphasis on *friluftsliv* in Norway (Abelsen & Leirhaug, 2017), the emergence of regular *uteskole* in Norway around the turn of the last century (Jordet, 2010) and the subsequent focus on *uteskole* in the physical education specialisation of

teacher training might have led to a focus on physical education, particularly on knowledge and skills related to *friluftsliv*, in the practice of *uteskole*.

Our findings, along with the research presented above, strongly indicate a conceptual merging between *uteskole* and *friluftsliv* and that the dominance of *friluftsliv* as the main learning content makes it difficult for practitioners of *uteskole* to identify central and important theoretical and practical differences. Annie, teacher at School 1, describes this as follows:

> Uteskole is the main arena for teaching friluftsliv. When we think about skiing, skating, hiking and bonfires, these are not something every Norwegian does regularly, but they're important parts of our culture that can be passed on to all the kids with a completely different culture in a natural way, which they don't necessarily encounter elsewhere (Winje & Løndal, 2021a, p. 142).

What are the possible practical consequences of this conceptual merging of *uteskole* and *friluftsliv*? As described in Chapter 2, *friluftsliv* is a central element in Norwegian society, both as a leisure-time activity and a key element in the primary and secondary education curricula . The Norwegian focus on *friluftsliv*, both in terms of culture and education, is often described as quite romantic, emphasising getting out of the noisy city and reconnecting with nature (Gelter, 2000). Goga et al. (2018) include *friluftsliv* as one of the main elements in their *nature in culture matrix* and underline its celebratory position, which implies the idea of the *pure child* or a *child in nature*, as a key figure in Norwegian culture and pedagogy; this clearly has traces of what Roberts (2012) describes as the romantic current of experiential education. According to him, the main problem with this romantic perspective of learning is its incorporation into curriculum programmes. It is impossible for pupils to learn the same things and reach the curriculum aims if the emphasis is on their subjective experiences, undisturbed by culture. Our findings in Article 2 indicate that the practice of *uteskole* as *friluftsliv* seems to signify an unreflected and perhaps unintended shift towards a romantic notion of learning in the practice of *uteskole* (Winje & Løndal, 2021a). Jordet (2010, p. 29) explicitly warns about the danger of *uteskole* being locked in learning models in which teachers are overly inspired by their own experiences with, for example, *friluftsliv*. He bases his didactic model of *uteskole* on Dewey's (1938) notion of experience and learning, which, in contrast to the romantic perspective, clearly emphasises the importance of establishing connections between pupils' own experiences and the knowledge accumulated by society, in line with Roberts' (2012) description of the pragmatist current of experiential education. The main idea of *uteskole* is to give pupils first-hand experiences outside of the classroom together with their classmates and teachers so that these experiences can be processed, reflected on, discussed

and elaborated on, and, in this way, connections between the pupils' own and collective experiences and the curriculum can be established (Jordet, 2010). If the focus in the practise of *uteskole as friluftsliv* is mainly on facilitating first-hand experiences, and not on establishing continuity between these experiences and the curriculum, one may conclude that it is hardly in line with the didactic model of *uteskole*.

6.3.3. Uteskole as indoor learning activities outdoors

In Articles 2 and 3, we find that the teachers often organised learning activities outdoors, such as quizzes, calculations and language tasks (Winje & Løndal, 2021a, 2021b). An example would be the 50s game described in Article 2, in which the pupils were required to solve 50 different repetition tasks related to the learning content they were taught in religion, mathematics or science indoors. The task sheets were spread over a limited area in the woods and had to be found, the tasks needed to be solved, and the solutions should be returned to the teachers; these learning activities were quite similar, both in presentation and solution, to tasks normally done in the classroom. In other words, learning activities designed for an indoor setting were done outdoors. This excerpt from the field notes describes it as follows:

> Charlie takes 20 pupils away from the main group at the campsite to an open area. He lets the pupils choose who they want to pair up with and presents a piece of paper with four rebuses that reveal the names of four Norwegian inventions. (Winje & Løndal, 2021a, p. 143)

As described in Chapter 1.1, I must admit that these were the types of learning activities I used when I myself practised *uteskole* as a young teacher. Osberg et al. (2008) describe how schools are established as separate educational worlds for learning, where representations of the environment outside of school become the defining features of school. Jordet (2010) describes how text has a monopoly as the provider of learning content, whereas the classroom has a monopoly as the learning arena. These monopolies reinforce the structure and disciplining framework for teaching and learning activities. Biesta and Burbules (2003) refer to this understanding of knowledge as a representational epistemology; what is presented in education stands for something else that is *out there*. Nicol (2003) claims that representational epistemology is a historically inherited position that has become a deeply embedded cultural construct acting as an invisible mediator of knowledge that affects and shapes current teaching practices. Our findings in Articles 2 and 3 are in line with Nicol's description; teachers facilitate learning activities outdoors, and these involve the repetition of previously taught curriculum content, letters, numbers and calculus on laminated sheets, required to carry out tasks that are incoherent with the outdoors setting.

Barfod (2018a) describes how alternative learning arenas, such as outdoors, have a tendency to become unintendedly *schoolified*, where teaching activities from traditional learning arenas are reproduced. This gives rise to a paradox in which the teachers argue that their intention with *uteskole* is to facilitate first-hand experiences for their pupils, but they end up mainly working with representations of the outside world *brought into the context that it is meant to represent*. The arguments for going outside cannot be found in the relevance of the environment; rather, it is a useful backdrop for theoretical learning activities because of, for example, less noise, fresh air or the possibility for more movement and physical activity. As we describe in Article 2, 'This is a potent example of how a representational epistemology permeates teachers' practices and becomes the main focus of *uteskole*' (Winje & Løndal, 2021a, p. 146). Jordet (2010) argues that if teachers do nothing but transfer indoor learning activities outdoors, then it does not make sense to use the term *uteskole*. Teachers must use the resources and inherent possibilities in the actual learning context when using the term *uteskole* to describe what is going on. This view is supported by the studies included in Remmen and Iversen's (2022) review, indicating that coherence does not always exist between learning tasks and learning in the outdoor setting (Iversen, 2021; Remmen & Frøyland, 2013).

6.3.4. Uteskole as an integrated practice

In Articles 2 and 3, the teachers occasionally organised learning activities aiming to integrate and apply knowledge learned in the classroom to authentic situations outdoors and vice versa (Winje & Løndal, 2021a, 2021b). An example is from Article 2, where the pupils were taught about maps and how to find routes to possible destinations. When they later went outdoors, they received a map and were tasked with using it to find their way to the *uteskole* location. Another example of integrated practice is from Article 3 where the pupils learned about non-migrating birds, how to prepare food for these birds indoors and, finally, how to hang the food they prepared in trees at the *uteskole* location and observe the birds eating. This type of connection between learning activities indoors and outdoors, however, is mostly related to the school subjects of physical education and science, specifically the subject themes of *friluftsliv* and biology. Therefore, an important aspect in such integrated practices should be the teachers' reflections on choices of outdoor context and how the choice of location determines the pupils' opportunities to transact with their surroundings in a way that is relevant to these subject themes, such as identifying trees, reading a map and comparing the information to the real landscape, orienteering using maps and managing bonfires to stay warm and cook a meal.

In relation to the school subjects of physical education and science, and primarily regarding *friluftsliv* and biology, the pupils experience an *uteskole* practice that entails both Dewey's (1938) criteria for educative experiences, transaction and continuity and Jordet's (2010) formulation of the didactic method of *uteskole*. In a Swedish context, Wilhelmsson et al. (2012) describe two different *natures* of outdoor education. One entails a holistic perspective in which learning in classroom settings and learning in outdoor settings interact, and another considers the outdoors as the main source of concrete and practical learning, while the classroom provides sources for theoretical knowledge. A *holistic nature* seems to be the one which aligns best with Dewey's (1938) notions of experience and learning because it resists the distinction between theory and practice, between indoor and outdoor, between knowledge and knowing. In their review, Remmen and Iversen (2022) identify three studies (Remmen & Frøyland, 2014, 2015a, 2015b) that explore the integrative connection between classroom and outdoor activities, all conducted within the context of geoscience in upper secondary school. They examine how fieldwork as a learning activity might facilitate deep learning processes and conclude as follows: there could be greater coherence between the teaching and learning processes in the classroom and outdoors, the quality of learning activities can be enhanced by stressing the importance of pre- and post-work conducted in the classroom, there is a need to limit the number of choices in learning activities, timesaving measures for transport should be adopted, and travel expenses should be limited. I think that their most important suggestion is described in their article from 2014, in which they present different approaches taken by teachers (i.e. alternating between indoor and outdoor contexts) and emphasise that the learning sequences do not necessarily start indoors and end up indoors (Remmen & Frøyland, 2014). This is similar to Wilhelmsson et al.'s (2012) description of a *holistic* approach, to Dewey's (1938) notion of continuity and the idea of an integrated *uteskole* practice. A good example from our findings in Article 3 is the continuity established in School 2, where the pupils' experiences in *uteskole* are occasionally processed and reflected on indoors and, during the following week, tested outdoors.

Remmen and Iversen (2022) find that although researchers on outdoor education in Nordic countries highlight the importance of connecting classroom and outdoor learning experiences to support learning, relatively few studies examine the potential learning trajectories of pupils between classroom and outdoor settings. They state that the main focus in Nordic outdoor ed-

ucation research seems to be cognitive learning and studies in which the research design contrasts the outcomes of classroom and outdoor learning, such as the works of Fägerstam (2014), Otte (2018; 2019).

6.4. Integrated practice and deep learning

In Article 3, we applied the experiential education framework of deep learning to our analyses of the pupils' experiences with *uteskole* (Winje & Løndal, 2021b) and found that some of the learning activities seemed to facilitate deep learning processes in line with the central didactic elements of transaction and continuity described by Jordet (2010). They are mainly found in learning activities that we describe as parts of an integrated *uteskole* practice, and they are related to learning activities that focus on *friluftsliv* and biology. These are taught in a formal, integrated fashion, in which the pupils mainly work with the theoretical aspects indoors, whereas they focus on first-hand experiences, practical knowledge and problem solving outdoors. As discussed above, an important aspect in such an integrated practice is the teachers' choice of context for the *uteskole* day which determines the pupils' opportunities to transact with their surroundings in a way that is relevant to the content that the pupils are learning about. If the teachers plan to work with medieval history, a relevant location might be the museum. If the teachers plan to work with the pupils' understanding of where their food comes from, then visiting a farm, a bakery or a butcher allows the pupils to transact with relevant environments. An integrated *uteskole* practice might facilitate pupils' learning about any school subject or theme, given that the teachers have chosen a relevant location, support the pupils in processing their experiences and connecting them with relevant school content. The findings in Article 3 indicate that through a regular integrated *uteskole* practice, the pupils might gain experiential knowing from their transactions with relevant environments, presentational knowing by internalising their experiences through talk, text or image, propositional knowing by processing their experiences further through abstract language or mathematics, and practical knowing by being given opportunities to test their understanding through problem solving in authentic contexts; the results also show that their actions in these contexts are not to be regarded as the end points but rather as parts of a continuous sequence of experiential learning (Winje & Løndal, 2021b).

The practice of *uteskole as friluftsliv*, which we consider part of the romantic current of experiential education, entails an understanding of learning that is difficult to incorporate into curriculum programmes (Winje & Løndal, 2021a). If we use Nicol's (2003) forms of knowing,

we might say that in this practice, there are possibilities for developing experiential knowing and practical knowing; however, the romantic view of learning as a subjective process that should not be influenced by culture makes it difficult to incorporate propositional learning and, to a certain degree, presentational knowing.

The practice of *uteskole* as *indoor learning activities outdoors*, which we suggest is part of the traditional notion of schooling, entails a view of knowledge that is in line with a representational epistemology (Winje & Løndal, 2021a). When we look at this practice through Nicol's (2003) forms of knowing, we find that propositional knowing is the primary form of knowing in this practice but that presentational knowing might also be included. However, there is a distinct lack of focus on experiential and practical knowing.

Summing up, our findings indicate that only *uteskole as an integrated practice* facilitates deep learning processes because the learning activities incorporate experiential, presentational, propositional and practical knowing. Future discussions, research efforts and teacher education on deep learning within the frames of *uteskole* may benefit from applying Nicol's (2003) multi-modal model of knowing and focusing on the embodied, affective, social and cognitive aspects of learning in primary and secondary education.

6.5. Strengths and limitations of this research project

In the following, I elaborate and discuss some of the strengths and limitations of this research project revolving around three main themes: 1) methods, 2) informants and 3) researcher bias.

6.5.1. Methods

This research project used two main methods for data collection: a systematic mapping review and fieldwork with participatory observations and qualitative interviews.

Systematic mapping review

The systematic mapping review was designed based on Moher et al.'s (2015) suggestions and protocol, providing a framework for the structure of the review process. This contributed to the strength of the study because it allowed for the whole review process to be planned in detail before the search was conducted.

Grant and Booth (2009) state that the comprehensiveness of searching in a systematic mapping review is determined by time and scoping constraints. In the current research project, the search string was developed after a thorough examination of central policy documents and research focusing on deep learning in education. It was a comprehensive search string of English keywords deemed relevant to identifying studies concerned with deep learning, and this

search is completely replicable in future research. However, my selection of policy documents, the total lack of systematic literature reviews on deep learning in primary and secondary education and my preference for English key terms in the search string facilitated the exclusion of other relevant key terms in the search string. Furthermore, I conducted the systematic search in three databases (ERIC, Education Source and Scopus) only; including other databases might have resulted in the identification of additional relevant publications. It is well known that many relevant studies are published as grey literature but including these would be far beyond the scope of this study. A systematic mapping review does not entail a formal quality and methodological assessment of publications (Grant & Booth, 2009). In my eligibility assessment of the publications, I only established that they were published in peer-reviewed journals and that they provided a description of the data collection method and sampling of informants.

Fieldwork with participatory observations and qualitative interviews

Methodologically, this research project was positioned within a qualitative and interpretative landscape (Gadamer, 2010), in which my understanding was established through a dialogue between the informants' responses and my observations of their actions in *uteskole*. The starting point of this research project was broad, and the research questions guiding the study focused on the teachers' intentions and practices and the pupils' experiences. If theoretical perspectives for investigating deep learning within an experiential framework already existed, then the observation and interview guide could have incorporated these perspectives. Consequently, the observation guide was explorative and open, and it was up to me as the researcher to provide a coherent and descriptive narrative of the observations. Similarly, the interview guide consisted of open questions and, to a lesser degree, focused on asking the informants about aspects related directly to deep learning. This made me maintain an open mind, be less presumptuous and be less affected by theoretical conceptualisations in the data collection phase and in the early phases of the analyses. As a result, the connections between deep learning and the data material collected through the fieldwork were mainly products of my analyses and interpretations. My previous experience with uteskole both as teacher and researcher, and the familiarity with the concepts of deep learning, contributed to identify connections between deep learning and uteskole and thus strengthened my analyses and interpretation.

There is always an issue with the relationship between the complexity of didactics and empirical research, and there is often a need to reduce complexity (Biesta & Burbules, 2003). This might lead to a limited understanding of the teachers' intentions and practices of *uteskole* and

the pupils' experiences with *uteskole*. My use of analytical models led to reductions in complexity, but it was necessary in identifying central aspects and relevant theoretical perspectives.

6.5.2. Informants

Sampling biases are always important to observe. There is currently no list of schools conducting regular *uteskole* in Norway, which limited our sampling of teachers and pupils. We chose to include five teachers who all had relevant experiences with teaching *uteskole* (one female and four males), and the gender balance amongst our teacher informants could have been better, as this might have influenced the representativeness of the data material. It was difficult to achieve a better gender balance because of the schedule, workload and lack of experience with *uteskole* of other teachers in the schools. We did not have similar difficulties with gender balance among the pupil informants, and I was able to include five girls and five boys in the interviews. The opportunity to observe the informants for a prolonged period and the relatively small number of informants that were interviewed made it possible for me to spend more time with each of them and explore their experiences more deeply. This provided favourable conditions for fusion of horizons, establishing an understanding between the researcher's life-world and the informants' life-worlds during the data collection period.

6.5.3. Researcher bias

My own experience as a teacher practising regular *uteskole* and as a researcher of *uteskole* indicates that I am positive about its use as a pedagogical approach. However, I sought to uphold and practise a critical perspective, as reflected in my choice of the theoretical and epistemological perspective. This meant that I was familiar with the field, so I asked questions and looked for situations that were relevant to studies of *uteskole*. In the interview phase, I emphasised the need to obtain a broad understanding of the teachers' intentions and practice of *uteskole* and the pupils' experiences. I asked the participants to describe their positive experiences and their daily challenges and negative experiences with *uteskole*. The teachers were explicitly asked to detail situations in which their teaching was unsuccessful and to describe the potentially negative consequences of practising *uteskole* regularly; the pupils were asked to narrate both positive and negative experiences. The analyses were, as described above, carried out with open inductive coding (Braun et al., 2016), indicating that it was the data material that provided the foundation for the analyses, not the theoretical perspective. I made my observations, created field notes and engaged in analyses, so these were affected by my inter-

pretation and subjective understanding. This subjectivity is a condition for qualitative research, in which data and interpretations will always be shaped by social and personal positions.

7. Conclusion

In this project, I investigated how deep learning is understood in previous research on primary and secondary education and how *uteskole* can be practised to facilitate deep learning processes. Through a systematic mapping review of the term *deep learning*, and two main conceptualisations were identified: meaningful learning and transfer of learning. I discovered that deep learning was conceptualised mainly through cognitive learning perspectives; investigated within the school subjects of languages, science and mathematics; and studied among informants in the age range of 13–16. Some researchers criticise this adaptation of deep learning to general education and argue that the commonly used conceptualisations do not include the embodied, affective and social aspects of learning.

To contribute to a broader understanding of deep learning and incorporate the embodied, affective, social and cognitive aspects of learning, I adapted the two main conceptualisations of deep learning to an experiential education framework based on pragmatist philosophy. I also merged these two concepts and operationalised them in a didactic perspective through Nicol's (2003) four ways of knowing: experiential, presentational, propositional and practical knowing.

Through the findings of a fieldwork conducted in two Norwegian primary schools practising regular *uteskole*, I showed that *uteskole* is an approach that facilitates Nicol's (2003) four ways of knowing. I learned that there is not one coherent practice of *uteskole* but at least three distinct practices: *uteskole as friluftsliv, uteskole as indoor learning activities outdoors* and *uteskole as an integrated practice*. I argued that only *uteskole as an integrated practice* can be regarded as facilitating deep learning according to the experiential education framework.

7.1. Implications

The findings in this research project may have implications for teacher training programmes and future research. In Article 1, we suggested that to adapt deep learning to all school subjects, particularly PAS subjects, a holistic understanding of the concept should be accentuated in teacher training programmes, with a focus on incorporating the embodied, affective, social and cognitive aspects of learning.

The results of Article 2 are relevant in relation to teacher training programmes focusing on *uteskole*. The teachers practising *uteskole* described that finding the time and resources to conduct *uteskole* as they intended was challenging. Therefore, teacher training programmes

should address how *uteskole* teachers can plan, structure and develop a regular *uteskole* practice within the school schedule. We also found that the teachers struggled with handling and manoeuvring in different epistemological positions. For *uteskole* to more consistently contribute to Norwegian schools' commitment to deep learning, teacher training programmes should focus on learning about the different epistemological positions and how these might influence the practice of *uteskole*. We also suggested that *uteskole* should be a theme within all teacher training specialisations, not only physical education and science, to strengthen the practice of *uteskole* and support it as a cross-curricular practice.

Future research on deep learning should apply a broad range of perspectives, including the embodied, emotional, social and cognitive aspects of learning, and investigate deep learning in all age ranges and all school subjects. The relationship between deep learning and the transfer of learning should be elaborated upon.

Future research on *uteskole* should focus on critically applying its foundational philosophical framework and, in particular, on investigating the relationship between indoor and outdoor learning activities.

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Attachments

Observasjonsguide Uteskole/Klasserom

Dato:

Hva observeres?	**Hva ser jeg etter?**	**Merknader**
Oppstart	Hvordan starter dagen? Hvordan presenteres dagen? Hvilke mål har de for dagen? Hvordan fremstår elevene? (motivert, spent, oppmerksomme)	
Friminutt	Hva gjør elevene? Legger lærerne til rette for aktivitet? Hvilke regler gjelder/håndheves?	
Uteskolekontekst /Klasserom	Hvordan ser området/stedet/rommet ut? Hvilke områder brukes ofte? Hvor stor plass har elevene til å bevege seg?	

Matlaging og måltid (på uteskole)	Hvordan lages maten? Hvem lager den? Hva lages? Hvor spises det?(ser det ut som elevene liker maten) Spiser lærere og elever samme maten? Hvor mye spiser elevene? Hvor mye spiser lærerne? Gjenspeiler måltidet trivsel? (trivseluttrykk)	
Generell trivsel	Latter, smil, glede, frustrasjon	
Undervisning	Hvilke fag legges det vekt på? Hvilke arbeidsmetoder? Hvordan oppfører elevene seg?(interesserte, avvisende, nysgjerrige)	
Tilpasning til årstid (uteskole)	Hvordan tilpasses uteskolen de ulike årstidene? Ulike fremkomstmidler? (ski, sykkel, akebrett, pulk) Andre aktiviteter?	
Regler/Frihet	Har elevene mulighet til fri aktivitet underveis i undervisningssituasjonen?	

Forutsetninger	Hvordan beveger elevene seg? Er det noen som er mer/mindre kompetente i bevegelse enn andre? Hvordan vises dette?	
Samarbeid	Hvem samarbeider? Hvilke oppgaver? Hvordan samarbeider de? Er det noen som ikke samarbeider/faller utenfor?	
Avslutning	Hvordan avsluttes dagen? Hvordan bearbeides elevens erfaringer fra dagen? Hvordan fremstår elevene? (motivert, spent, oppmerksomme)	

Intervjuguide – Elever Skole 1

<u>Innledning: (tuning)</u> 1. Har du gått på noen andre skoler enn …. i Norge? 2. Hvilke tre fag liker du best på skolen? 3. Hvorfor liker du disse fagene best? 4. Hvis du kunne velge fritt, hvor i verden vil du helst bo når du e voksen? 5. Hva vil du bli når du blir voksen? ***"Ingen av spørsmålene jeg har stilt deg har hatt et riktig eller galt svar. Sånn er det med resten av spørsmålene jeg skal stille deg også. Jeg har lyst til å høre hva bare du tenker og hva du mener."***	
<u>Uteskole generelt:</u> ***"…. er en av få skoler i Oslo som har uteskole. Jeg prøver å finne ut om hvordan uteskole er for dere som har det."*** 1. Kan du fortelle meg litt om hva dere gjorde på uteskolen forrige uke? (tuning) 2. Hvordan underviser læreren deres i klasserommet? 3. Hvordan underviser læreren deres på uteskolen? 4. Blir dere undervist på en annen måte på uteskole enn i klasserommet? 5. Er det noe du synes er lettere å lære i klasserommet enn på uteskolen? 6. Er det noe du synes er lettere å lære på uteskolen enn i klasserommet? 7. Kan du nevne tre forskjellige måter du har bruker kroppen på uteskole? 8. Kan du nevne tre forskjellige måter du har bruker kroppen inne i klasserommet? 9. Kan du nevne tre ting du liker med uteskole? 10. Kan du nevne tre ting du <u>ikke</u> liker med uteskole? 11. Kan du nevne tre ting du liker med vanlig klasseromsundervisning? 12. Kan du nevne tre ting du <u>ikke</u> liker med vanlig klasseromsundervisning	

<u>Lek som læring:</u> 1. Får dere lov til å leke på uteskolen? 2. Får dere lov til å leke når dere har undervisning i klasserommet? 3. Går det an å leke og lære samtidig? a. Har du gjort det noen gang? b. Kan du fortelle om det?	
<u>Uteskole – For/Etterarbeid:</u> 4. Gjør dere noe i klasserommet før dere går på uteskole? 5. Gjør dere noe når dere kommer tilbake til klasserommet på slutten av uteskoledagen? a. Kan du fortelle litt om uteskoleboken? a. Hva skriver du i den? b. Er det du eller lærerne som bestemmer hva som skal stå i den? c. Hva synes du om å arbeide med uteskoleboken?	

Intervjuguide – Elever Skole 2

<u>Innledning: (tuning)</u> 1. Har du gått på noen andre skoler enn …. i Norge? 2. Hvilke tre fag liker du best på skolen? 3. Hvorfor liker du disse fagene best? 4. Hvis du kunne velge fritt, hvor i verden vil du helst bo når du e voksen? 5. Hva vil du bli når du blir voksen? ***"Ingen av spørsmålene jeg har stilt deg har hatt et riktig eller galt svar. Sånn er det med resten av spørsmålene jeg skal stille deg også. Jeg har lyst til å høre hva bare du tenker og hva du mener."***	
<u>Uteskole generelt:</u> ***"…. er en av få skoler i Oslo som har uteskole. Jeg prøver å finne ut om hvordan uteskole er for dere som har det."*** 1. Kan du fortelle meg litt om hva dere gjorde på uteskolen forrige uke? (tuning) 2. Hvordan underviser læreren deres i klasserommet? 3. Hvordan underviser læreren deres på uteskolen? 4. Blir dere undervist på en annen måte på uteskole enn i klasserommet? 5. Hva liker du best, klasseromsundervisning eller uteskole? a. Hvorfor? 6. Er det noe du synes er lettere å lære i klasserommet enn på uteskolen? 7. Er det noe du synes er lettere å lære på uteskolen enn i klasserommet? 8. Kan du nevne tre forskjellige måter du har bruker kroppen på uteskole? 9. Kan du nevne tre forskjellige måter du har bruker kroppen inne i klasserommet? 10. Kan du nevne tre ting du liker med uteskole? 11. Kan du nevne tre ting du <u>ikke</u> liker med uteskole? 12. Kan du nevne tre ting du liker med vanlig klasseromsundervisning?	

13. Kan du nevne tre ting du <u>ikke</u> liker med vanlig klasseromsundervisning	
<u>Lek som læring:</u> 1. Får dere lov til å leke på uteskolen? 2. Får dere lov til å leke når dere har undervisning i klasserommet? 3. Synes du at det er mye lek på uteskolen? 4. Går det an å leke og lære samtidig? a. Har du gjort det noen gang? b. Kan du fortelle om det? 5. Kan du komme med et eksempel på undervisning som dere har hatt som ligner på lek? 6. Tror du mange liker uteskoleundervisning fordi da slipper de å sitte stille på pulten? c. Hvis ja, hvorfor er det så ille å sitte i klasserommet? 7. Kan det bli for mye lek og for lite læring på uteskolen? d. Kan du fortelle om en gang hvor det var veldig gøy, men hvor du kanskje ikke lærte så mye?	
<u>Uteskole – For/Etterarbeid:</u> 8. Gjør dere noe for å forberede dere på uteskole? (tuning) 9. Gjør dere noe etter at dere har vært på uteskole? (tuning) 10. Kan du fortelle litt om uteskoleboken? a. Hva skriver du i den? b. Er det du eller lærerne som bestemmer hva som skal stå i den? c. Hva synes du om å arbeide i uteskoleboken?	

Intervjuguide lærere – Skole 1

Navn:

Spørsmål	Kroppsspråk
Tuning: 1. Hva heter du? 2. Hvor lenge har du jobbet på skolen? 3. Hvilke fagspesialisering har du? 4. Søkte du deg hit på grunn av uteskoleundervisning? 5. Har du jobbet med uteskoleundervisning på en annen skole tidligere?	

Uteskole generelt: Innledning: *"Skole 1 er en av skolene i Oslo som har uteskole. Jeg prøver å finne ut om hvordan uteskole som undervisningsform erfares av dere. Bakgrunnen for dette er at jeg vil undersøke om og eventuelt hvordan uteskoleundervisning kan være et tilskudd til Oslo-skolen."* 1. Kan du fortelle meg litt om hva dere gjorde på uteskole sist gang dere hadde det? (tuning) 2. Kan du nevne tre sentrale arbeidsmåter dere bruker på i uteskoleundervisning? (gruppearbeid, stasjonsundervisning, induktiv, deduktiv, etc.) 3. Hva er den viktigste forskjellen på undervisningsmetodene du benytter når du underviser i klasserommet og på uteskole? 4. Hvilke fag knytter dere til uteskolen? 5. Er det noen fag som det er lettere å knytte til uteskolen enn andre? a. Hvorfor det?	
Dybdelæring: Innledning: *«Dybdelæring er et mye brukt begrep i skolepolitiske dokumenter i disse dager.»* 6. Hva tenker du når jeg sier: «dybdelæring»?	

a. Tror du at dette fokuset på dybdelæring vil føre til noen endringer i skolehverdagen? b. Tror du at det vil føre til noen endringer i din undervisningspraksis? c. Synes du at det er behov for slike endringer? d. Ser du noen kobling mellom dybdelæring og uteskole?	
Innledning: "*Kroppen som læringsmedium er en viktig term i kroppsøvingsteori."* 7. Hvordan forstår du kroppen som læringsmedium? a. Hva tenker du er forskjellen på hvordan elevene bruker kroppen som læringsmedium i klasseromsundervisning og i uteskoleundervisning? 8. Kan du nevne (noen) inntil tre ting du synes er krevende og vanskelig med uteskole? 9. Kan du nevne (noen) inntil tre ting du synes er stimulerende og utfordrende med uteskole?	

Lek som læring: 10. Hva tenker du om/Hva er ditt syn på/Hvilken plass mener du at lek har i undervisningssammenheng? 11. Hvilken plass har lek i uteskoleundervisningen? a. Hvordan? b. Hvorfor? 12. Vil du si at det er forskjell på lekens plass i uteskoleundervisningen og klasseromsundervisningen? b. Hva tenker du kan være grunnen til dette?	
Gode eksempler: 13. Hvilke pedagogiske muligheter synes du uteskoleundervisning gir? (Som klasseromsundervisning ikke gir?) 14. Kan du nevne tre ting du legger vekt på at elevene skal lære/erfare/oppleve på uteskolen? 15. Kan du fortelle om en hendelse som du synes illustrerer et positivt trekk med uteskolen? 16. Hva ved dette mener du gjorde dette til en positiv hendelse? 17. Kan du fortelle om en hendelse som du synes illustrerer et negativt trekk med uteskolen? 18. Hva ved dette mener du gjorde dette til en negativ hendelse?	

19.Hvis du nå skulle oppsummere, hva synes du er den viktigste forskjellen på uteskoleundervisning og klasseromsundervisning?	

Uteskole i Osloskolen: Innledning: *"Hvis vi "røft regnet" sier at elevene har uteskole en dag i uken i de to første skoleårene sine. Da vil de ha gjennomført ca. 76 dager med uteskoleundervisning i løpet av sine to første skoleår. Dette tilsvarer omtrent 20 prosent av undervisningstiden."* 20.Sett på denne måten, hva tror du er de viktigste (langsiktige) gevinstene for elevene? 21. Sett på denne måten, hva tror du kan være (langsiktige) tap for elevene? 22.Hva synes du om uteskole som undervisningsform? c. Nyttig/byrde d. Kan den bidra med noe som Osloskolen mangler? 23.Mener du som lærer at andre skoler i Oslo mer aktivt burde benytte seg av uteskole som undervisningsmetode? e. Hvis ja…. Hvor mange ganger i uken synes du at man burde ha uteskoleundervisning?	

Uteskole spesifikt på Skole 1: «*Jeg har lyst til å nevne noen observasjoner jeg gjorde i feltarbeidet mitt også vil jeg gjerne at du forteller meg hva du tenker når jeg forteller deg om disse*» 24. Dagen da vi var oppe på den lille høyden er det flere elever som smører ansiktet sitt inn med blåbær og går med det resten av dagen. f. Hva tenker du når jeg nevner dette? g. Hvorfor tror du de gjør dette? 25. Dagen da vi var på jordet bortenfor skolen noen av elevene seg inn med kull i ansiktet. Da ble det lagt merke til relativt kjapt, og elevene fikk beskjed om å ta det bort. h. Hva tenker du om dette? i. Var det noen forskjell på situasjonene? 26. En av uteskoledagene er det to elever som rusler stille rundt og plukker blåbær mens resten av klassen har undervisning. De snakker litt sammen og beveger seg med forsiktige bevegelser og spiser blåbærene mens de plukker dem. Jeg oppfatter det slik at de to elevene har det veldig fint. I løpet av en økt på 10 minutter er gutten i tillegg med på begge aktivitetene som skjer i nærheten. j. Hva tenker du om dette?	

27. Kan du beskrive hvordan du opplever å komme tilbake til skolen på slutten av en uteskoledag og elevene skal begynne med etterarbeid? k. Hvorfor tror du elevene reagerer slik? l. Hvilken betydning tenker du at etterarbeidet har for uteskoleundervisningen? 28. I høst var det en dag hvor det plutselig kom snøfall og dere skulle ha uteskole. Mens vi gikk mot uteskolestedet laget noen av elevene snøengler, noen vasset i en bekk med vann til livet, mens andre laget seg en ladning med snøballer som de bar med seg i en stor pose. m. Hva tenker du når jeg beskriver dette? n. Hvordan tror du elevene hadde det på vei til uteskoleområdet? 29. Etter lunsj den dagen avslutter dere undervisningen ute og går tilbake til skolen. o. Kan du fortelle litt om hvordan du opplevde den dagen?	

# Tid til overs eller manglende metning	
Lek som læring forts: 30. Tror du mange elever liker uteskole fordi de slipper å sitte stille? 31. Blir det mer kjefting på uteskolen eller i klasserommet?	
Uteskole generelt forts: 32. Hvordan forbereder du/dere lærere uteskoleundervisning? 33. Hvordan forbereder dere elevene på uteskoledagen? 34. Hvilke element er helt avgjørende for at en uteskoledag skal bli bra? p. Forberedelse? q. Vær? r. Elevenes innstilling? s. Utstyr? 35. Kan du nevne tre ting du skulle ønske du kunne bruke mindre tid på i uteskole? 36. Kan du nevne tre ting du skulle ønske du hadde mer tid til på uteskolen?	

Intervjuguide lærere – Skole 2

Navn:

Spørsmål	Kroppsspråk
Tuning: 1. Hva heter du? 2. Hvor lenge har du jobbet på skolen? 3. Hvilke fagspesialisering har du? 4. Søkte du deg hit på grunn av uteskole-undervisning? 5. Har du jobbet med denne formen for undervisning på en annen skole tidligere?	

Uteskole generelt:

Innledning: *"Skole 2 av skolene i Oslo som har regelmessig uteskole. Jeg prøver å finne ut om hvordan denne undervisningsformen erfares av dere. Bakgrunnen for dette er at jeg vil undersøke om og eventuelt hvordan uteskole kan være et tilskudd til Oslo-skolen."*

6. Kan du fortelle meg litt om hva dere gjorde på uteskole sist gang dere hadde det? (tuning)
7. Kan du nevne tre sentrale arbeidsmåter dere bruker i uteskole? (gruppearbeid, stasjonsundervisning, induktiv, deduktiv, etc.)
8. Hva er den viktigste forskjellen på undervisningsmetodene du benytter når du underviser i klasserommet og på uteskole?
9. Hvilke fag knytter dere til uteskole?
10. Er det noen fag som det er lettere å knytte til uteskole enn andre?
    a. Hvorfor det?

Innledning: *«Dybdelæring er et mye brukt begrep i skolepolitiske dokumenter i disse dager.»*

11. Hva tenker du når jeg sier: «dybdelæring»?
    a. Tror du at dette fokuset på dybdelæring vil føre til noen endringer i skolehverdagen?
    b. Tror du at det vil føre til noen endringer i din undervisningspraksis?

c. Synes du at det er behov for slike endringer? d. Tenker du at uteskole kan være et bidrag til elevers dybdelæring? Innledning:*"Kroppen som læringsmedium er en viktig term i kroppsøvingsteori."* 12. Hvordan forstår du kroppen som læringsmedium? a. Hva tenker du er forskjellen på hvordan elevene bruker kroppen som læringsmedium i klasseromsundervisning og i uteskole? 13. Kan du nevne (noen) inntil tre ting du synes er krevende og vanskelig med uteskole? **14.** Kan du nevne (noen) inntil tre ting du synes er stimulerende og utfordrende med uteskole? Innledning: «Dere har lagt det opp slik at dere også har undervisning i «uteskole» i klasserommet». 15. Kan du fortelle litt om hva dere fokuserer på i uteskole-undervisningen i klasserommet? 16. Kan du fortelle litt om forholdet mellom det dere gjør i klasserommet og det dere gjør når dere har uteskole utenfor klasserommet?	

Lek som læring: 17. Hva tenker du om/Hva er ditt syn på/Hvilken plass mener du at lek har i undervisningssammenheng? 18. Hvilken plass har lek i uteskole? a. Hvordan? b. Hvorfor? 19. Vil du si at det er forskjell på lekens plass i uteskole og klasseromsundervisningen? a. Hva tenker du kan være grunnen til dette?	
Gode eksempler: 20. Hvilke pedagogiske muligheter synes du uteskole gir? (Som klasseromsundervisning ikke gir?) 21. Kan du nevne tre ting du legger vekt på at elevene skal lære/erfare/oppleve på uteskole? 22. Kan du fortelle om en hendelse som du synes illustrerer et positivt trekk med uteskole? a. Hva ved dette mener du gjorde dette til en positiv hendelse? 23. Kan du fortelle om en hendelse som du synes illustrerer et negativt trekk med uteskole? a. Hva ved dette mener du gjorde dette til en negativ hendelse? 24. Hvis du nå skulle oppsummere, hva synes du er den viktigste forskjellen på uteskole og klasseromsundervisning?	

Uteskole i Osloskolen: Innledning Skole 2: *«Hvis vi «røft regnet» (siden dere har gruppedeling) sier at elevene har uteskole en dag, annenhver uke, hvert år i løpet av 5., 6. og 7. trinn.* 25.Hva tror du er de viktigste (langsiktige) gevinstene for elevene? 26. Hva tror du kan være (langsiktige) tap for elevene? 27.Hva synes du om uteskole som undervisningsform? a. Nyttig/byrde b. Kan den bidra med noe som Osloskolen mangler? 28.Mener du som lærer at andre skoler i Oslo mer aktivt burde benytte seg av uteskole som undervisningsmetode? a. Hvis ja…. Hvor mange ganger i uken synes du at man burde ha uteskoleundervisning?	

Uteskole spesifikt på Skole 2:

Innledning: «*Jeg har lyst til å nevne noen observasjoner jeg gjorde i feltarbeidet mitt også vil jeg gjerne at du forteller meg hva du tenker når forteller deg om disse*»

29. Vi har drikkepause på vei til et av deres faste uteskoleområder. En av 5.trinnselevene snur seg til en gruppe elever og sier: «nå kommer den bratte bakken, det blir så kult». Flere andre elever i nærheten nikker til guttens utsagn.
    a. Hva tenker du om dette?
    b. Hvor ofte tror du elevene uttrykker denne typen følelser i løpet av en skoledag?
    c. Er dette noe dere ønsker at uteskole skal bidra til?
30. Vi sykler en bratt motbakke og en gruppe jenter har havnet et stykke bak resten av gruppen. De er slitne og klager. Plutselig snur en av jentene seg til den som ser mest sliten ut og sier: «Kom hit, så skal jeg dytte deg opp». Sittende på sin egen sykkel legger jenten hånden sin på ryggen til den andre jenten og dytter henne opp bakken, mens hun sykler selv.
    a. Hva tenker du om dette?
31. Flere ganger når jeg kommer til toppen av en av de tyngre motbakkene vi har syklet, så står det elever på toppen og sier til meg: «Jeg syklet opp hele» eller «jeg stoppet bare to ganger underveis».
    a. Hva tenker du om dette?

32. En av dagene med uteskole var vi ved et vann. Det var is på vannet, og i starten fikk ikke elevene gå utpå, men etter hvert fikk alle lov. a. Kan du beskrive hvordan elevene oppførte seg da de fikk lov til å gå ut på isen? b. Hvorfor tror du de oppførte seg slik? c. Har dette noen verdi? 33.En av dagen går jeg sammen med elevene mens de skal orientere seg i nærområdet. De har vært litt usikre på orienteringen, og når de endelig ser den begynner de å synge «Seier'n er vår». a. Hva tenker du om dette?	

# Tid til overs eller manglende metning	
Lek som læring forts: 34. Tror du mange elever liker uteskole fordi de slipper å sitte stille? 35. Blir det mer kjefting på uteskolen eller i klasserommet?	
Uteskole generelt forts: 36. Hvordan forbereder du/dere lærere uteskoleundervisning? 37. Hvordan forbereder dere elevene på uteskoledagen? 38. Hvilke element er helt avgjørende for at en uteskoledag skal bli bra? a. Forberedelse b. Vær c. Elevenes innstilling d. Utstyr <u>Innledning:</u> 39. Kan du nevne tre ting du skulle ønske du kunne bruke mindre tid på i uteskole? 40. Kan du nevne tre ting du skulle ønske du hadde mer tid til på uteskolen?	

Dybdelæring gjennomuteskoleundervisning

- Informasjonsskriv for foresatte -

Hei,

Jeg heter Øystein Winje og skriver en doktorgrad ved OsloMet – storbyuniversitetet, det som tidligere het *Høgskolen i Oslo og Akershus* (HiOA). Jeg er utdannet lærer og før jeg begynte å skrive doktorgrad, arbeidet jeg som kontaktlærer på Refstad Skole.

I doktorgradsprosjektet mitt skal jeg undersøke hvordan lærere underviser på *uteskole*, og hvordan elever lærer på *uteskole*. Siden ***Skole 1/Skole 2*** har *uteskoleundervisning* hver uke har jeg fått lov av rektor til å være til stede i undervisningen på skolen og intervjue noen lærere og elever.

Jeg vil være til stede både i undervisningen og i friminuttene, slik at jeg blir litt bedre kjent med elevene, men jeg kommer ikke til å filme eller ta bilde av elevene, jeg vil kun skrive ned det jeg ser. Jeg vil også intervjue noen elever for å høre hva de synes om å ha *uteskole*. Intervjuene blir tatt opp på båndopptaker, intervjuet vil ta 30 minutter, og jeg blir enige med kontaktlærer og eleven om tid og sted for intervjuet.

Det er helt frivillig å være med i denne undersøkelsen og deres barn har mulighet til å trekke seg når som helst underveis, uten å oppgi noen grunn for det. Dersom eleven trekker seg, vil all informasjon jeg har samlet inn om det bli slettet og det vil ikke bli brukt i doktorgraden. Ingen andre enn meg selv vil ha lov til å høre på båndopptakene med eleven, og jeg kan heller ikke fortelle andre hvem jeg har intervjuet eller snakket med, eller hva som er blitt sagt. Dette gjelder alt som er sagt og gjort, både i intervjuet, under observasjonen i klasserommet, på *uteskole* og i friminuttene.

Skolens navn vil ikke bli nevnt i doktorgraden, all informasjon vil bli anonymisert og opptakene slettes når doktorgraden er ferdig innen utgangen av 2020. Det er en mulighet for at noen av de som leser oppgaven kan kjenne igjen noen av deltakerne (indirekte gjenkjennelse).

Hvis det er i orden for deg/dere at barnet deres barn deltar i undersøkelsen bestående av observasjon på uteskolen og intervju, må dere skrive under på den vedlagte samtykkeerklæringen og levere den til kontaktlærer.

Hvis det er noe du lurer på kan du ringe meg på 97562059, eller sende en e-post til oywin@oslomet.no

Du kan også kontakte min veileder Knut Løndal ved OsloMet på telefonnummer 67 23 73 11 eller sende en e-post til Knut.Londal@oslomet.no

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste A/S.

Vennlig hilsen

Øystein Winje

Samtykkeerklæring:

Jeg har mottatt informasjon om studien "*Dybdelæring gjennom uteskoleundervisning"*, og samtykker i at mitt/vårt barn kan delta i undersøkelsen, bestående av observasjon og intervju.

Signatur foresatt …….....

Signatur elev ……..

Navn på elev (Blokkbokstaver) …….....

Dybdelæring gjennom uteskoleundervisning

- Informasjonsskriv for lærere -

Hei,

Jeg heter Øystein Winje og er PhD-stipendiat ved OsloMet – storbyuniversitetet, tidligere *Høgskolen i Oslo og Akershus* (HiOA). Jeg er utdannet lektor og har arbeidet fire år som kontaktlærer på Refstad Skole, før jeg fikk stipendiat-stilling på OsloMet i desember 2016. Studien jeg skal gjennomføre på deres skole er en del av doktorgradsprosjektet mitt, *Dybdelæring gjennom uteskoleundervisning*. Målet med studien er å undersøke om regelmessig undervisning utenfor klasserommet kan bidra til dybdelæring.

For å finne ut av dette skal jeg følge deres klasse i undervisning både i klasserommet og på *uteskole* for å observere hvordan barna arbeider og bruker kunnskapen sin og hvordan dere som lærere legger opp undervisningen. Jeg vil delta både i undervisningen og i friminuttene, slik at jeg blir litt bedre kjent med elevene. I tillegg vil jeg gjerne foreta et litt lengre intervju med lærerne tilknyttet *uteskole* for å høre hva dere synes om denne undervisningsformen og hvordan dere arbeider. Jeg vil ta opp intervjusamtalene på båndopptaker, intervjuet vil ta mellom 45 -60 minutter og vi blir sammen enige om tid og sted.

Det er helt frivillig å være med og du har mulighet til å trekke deg når som helst underveis, uten at du må oppgi noen grunn for det. Dersom du trekker deg, vil all informasjon jeg har samlet inn fra deg bli slettet og vil ikke bli brukt i doktorgraden. Ingen andre enn meg selv vil ha lov til å høre på båndopptakene med deg, og jeg kan heller ikke fortelle hvem jeg har intervjuet eller snakket med, eller hva som er blitt sagt. Dette gjelder alt som er sagt og gjort, både i intervjuet, under observasjonen på *uteskole* og i friminuttene.

Skolens navn vil ikke bli nevnt i doktorgraden, all informasjon vil bli anonymisert og opptakene slettes når doktorgraden er ferdig innen utgangen av 2020. Det er en mulighet for at noen av de som leser oppgaven kan kjenne igjen noen av deltakerne (indirekte gjenkjennelse).

Dersom du kan tenke deg å hjelpe meg med denne undersøkelsen som består av observasjon på uteskolen og intervju, må du skrive under på den vedlagte samtykkeerklæringen og levere den til undertegnede.

Hvis det er noe du lurer på kan du ringe meg på 97562059, eller sende en e-post til oywin@oslomet.no

Du kan også kontakte min veileder Knut Løndal ved OsloMet

på telefonnummer 67 23 73 11 eller sende en e-post til Knut.Londal@oslomet.no

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste A/S.

Vennlig hilsen

Øystein Winje

Samtykkeerklæring:

Jeg har mottatt informasjon om studien *"Dybdelæring gjennom uteskoleundervisning"* og samtykker i å delta i undersøkelsen, bestående av observasjon og intervju.

Signatur informant……

Navn med blokkbokstaver……..

Telefonnummer (valgfritt) ……

Dybdelæring gjennom uteskoleundervisning

- Informasjonsskriv for elever -

Hei,

Jeg heter Øystein Winje og skriver en stor oppgave ved et universitet som heter OsloMet – storbyuniversitetet. Denne store oppgaven kalles en doktorgrad. Før jeg begynte å skrive denne oppgaven jobbet jeg som lærer på Refstad Skole.

I den store oppgaven min skal jeg prøve å finne ut hvordan lærere underviser på *uteskolen* og hvordan elever lærer på *uteskolen*. For å finne ut av dette skal jeg være med deres klasse både i klasserommet og på *uteskole* denne høsten, for å se hva dere holder på med. Jeg vil være med både i undervisningen og i friminuttene, slik at vi kan bli litt bedre kjent. I tillegg vil jeg gjerne ha litt lengre intervju med noen elever for å høre hva dere synes om å ha *uteskole*. Jeg vil ta opp intervjusamtalene på båndopptaker, og intervjuet vil ta 30 minutter, og vi blir sammen med kontaktlæreren deres enige om tid og sted.

Det er helt frivillig å være med og du kan når som helst si at du ikke har lyst til å være med, og du trenger ikke å fortelle hvorfor du ikke vil være med. Dersom du ikke vil være med lenger vil all informasjon jeg har samlet inn fra deg bli slettet og det vil ikke bli brukt i oppgaven. Ingen andre enn meg selv vil ha lov til å høre på båndopptakene med deg, og jeg kan heller ikke fortelle hvem jeg har intervjuet eller snakket med, eller hva som er blitt sagt. Dette gjelder alt som er sagt og gjort, både i intervjuet, under observasjonen på *uteskole* og i friminuttene.

Skolens navn vil ikke bli nevnt i oppgaven, all informasjon vil bli skrevet ned slik at man ikke kan finne ut hvem som har sagt eller gjort hva og opptakene slettes når oppgaven er ferdig innen utgangen av 2020.

Dersom du kan tenke deg å hjelpe meg med denne oppgaven og synes det er greit at jeg er med og ser på undervisningen deres og kanskje intervjuer deg, må du skrive under på arket under og levere den til læreren din.

Hvis det er noe du lurer på kan du ringe meg på 97562059, eller sende en e-post til oywin@oslomet.no

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste A/S.

Vennlig hilsen

Øystein Winje

Samtykkeerklæring:

Jeg har mottatt informasjon om studien av «Dybdelæring gjennom uteskoleundervisning», og samtykker i å delta i undersøkelsen, bestående av observasjon og intervju.

Signatur elev ……

Navn med blokkbokstaver ……..

Øystein Winje
Postboks 4, St. Olavs plass
0130 OSLO

Vår dato: 08.06.2018 Vår ref: 60432 / 3 / LB Deres dato: Deres ref:

Vurdering fra NSD Personvernombudet for forskning § 31

Personvernombudet for forskning viser til meldeskjema mottatt 20.04.2018 for prosjektet:

60432	*Dybdelæring gjennom uteskoleundervisning*
Behandlingsansvarlig	*OsloMet - Storbyuniversitetet, ved institusjonens øverste leder*
Daglig ansvarlig	*Øystein Winje*

Vurdering

Etter gjennomgang av opplysningene i meldeskjemaet og øvrig dokumentasjon finner vi at prosjektet er meldepliktig og at personopplysningene som blir samlet inn i dette prosjektet er regulert av personopplysningsloven § 31. På den neste siden er vår vurdering av prosjektopplegget slik det er meldt til oss. Du kan nå gå i gang med å behandle personopplysninger.

Vilkår for vår anbefaling

Vår anbefaling forutsetter at du gjennomfører prosjektet i tråd med:

- opplysningene gitt i meldeskjemaet og øvrig dokumentasjon
- vår prosjektvurdering, se side 2
- eventuell korrespondanse med oss

Vi forutsetter at du ikke innhenter sensitive personopplysninger.

Meld fra hvis du gjør vesentlige endringer i prosjektet

Dersom prosjektet endrer seg, kan det være nødvendig å sende inn endringsmelding. På våre nettsider finner du svar på hvilke endringer du må melde, samt endringsskjema.

Opplysninger om prosjektet blir lagt ut på våre nettsider og i Meldingsarkivet

Vi har lagt ut opplysninger om prosjektet på nettsidene våre. Alle våre institusjoner har også tilgang til egne prosjekter i Meldingsarkivet.

Vi tar kontakt om status for behandling av personopplysninger ved prosjektslutt

Ved prosjektslutt 01.01.2021 vil vi ta kontakt for å avklare status for behandlingen av personopplysninger.

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

Se våre nettsider eller ta kontakt dersom du har spørsmål. Vi ønsker lykke til med prosjektet!

Dag Kiberg

Lene Christine M. Brandt

Kontaktperson: Lene Christine M. Brandt tlf: 55 58 89 26 / lene.brandt@nsd.no

Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 60432

FORMÅL
Formålet er å undersøke hvordan elevenes opplevelser og erfaringer i uteskoleundervisning kan bidra til dybdelæring i grunnskolen.

UTVALG OG REKRUTTERING
Utvalget består av elever og lærere i en skoleklasse. Rekruttering av lærerne skjer ved at forsker først oppretter kontakt med rektor. Elevene rekrutteres deretter gjennom lærerne.

INFORMASJON OG SAMTYKKE
Du har opplyst i meldeskjema at utvalget vil motta skriftlig og muntlig informasjon om prosjektet, og samtykke skriftlig til å delta. Vår vurdering er at informasjonsskrivene hovedsaklig er godt utformet. Imidlertid må setningene om identifisering i publikasjonen/oppgaven korrigeres i alle skrivene. Du skriver at all informasjon blir anonymisert, men at noen "kan kjenne igjen noen av de som har svart på undersøkelsen (indirekte gjenkjennelse)". Her må du enten skrive at "innsamlet data (utenom selve oppgaven) anonymiseres ved prosjektslutt. Det er en mulighet for at noen av de som leser oppgaven kan kjenne igjen noen av deltakerne (indirekte gjenkjennelse)". Alternativt må du bestemme deg for at du skal anonymisere informasjonen i oppgaven, slik at ingen er gjenkjennbar. I så fall kan du bare skrive at ingen deltakere vil kunne gjenkjennes i oppgaven.

Vi ber om at du sender det reviderte informasjonsskrivet til personvernombudet@nsd.no Husk å oppgi prosjektnummer. Prosjektet kan deretter starte.

Selv om barnets foresatte samtykker til barnets deltakelse i prosjektet, må også barnet gi sin aksept til å delta. Vi anbefaler at barnet mottar tilpasset informasjon om hva deltakelse i prosjektet innebærer. Du må sørge for at barnet forstår at deltakelse er frivillig, og at det kan trekke seg om det ønsker det.

DATAINNSAMLING
Data samles inn gjennom observasjon av skoleklassen i undervisning og friminutt, og gjennom intervju med noen av lærerne og elevene. Det skal ikke registreres opplysninger (heller ikke i forbindelse med observasjon) om andre enn de som samtykker til deltakelse.

Vi gjør oppmerksom på at lærerne i sine intervjuer ikke kan snakke identifiserende om enkeltelever, av hensyn til taushetsplikten. Dette bør du minne dem om i forkant av intervjuene. Dersom det legges opp til at de skal snakke om enkeltelever, må det innhentes eksplisitt samtykke fra de foresatte til dette.

INFORMASJONSSIKKERHET
Personvernombudet forutsetter at du behandler alle data i tråd med OsloMet - Storbyuniversitetet sine

retningslinjer for datahåndtering og informasjonssikkerhet. Vi legger til grunn at bruk av mobil lagringsenhet er i samsvar med institusjonens retningslinjer.

PROSJEKTSLUTT OG ANONYMISERING
Prosjektslutt er oppgitt til 01.01.2021. Det fremgår av meldeskjema/informasjonsskriv at du vil anonymisere datamaterialet ved prosjektslutt.

Anonymisering innebærer vanligvis å:
- slette direkte identifiserbare opplysninger som navn, fødselsnummer, koblingsnøkkel
- slette eller omskrive/gruppere indirekte identifiserbare opplysninger som bosted/arbeidssted, alder, kjønn
- slette lydopptak

For en utdypende beskrivelse av anonymisering av personopplysninger, se Datatilsynets veileder: https://www.datatilsynet.no/globalassets/global/regelverk-skjema/veiledere/anonymisering-veileder-041115.pdf

NYTT PERSONVERNREGELVERK
Ettersom du skal gjennomføre et langvarig prosjekt, vil dere måtte forholde dere til EUs personvernforordning, og ny norsk personopplysningslov. Dette regelverket erstatter dagens personopplysningslov, og regelverket er ventet å tre i kraft i løpet av sommeren/høsten 2018. Ettersom dagens personopplysningslov fortsatt gjelder, har ombudet ikke vurdert om prosjektet vil være i overensstemmelse med det nye regelverket når dette trer i kraft. Som utgangspunkt må behandlingsansvarlig institusjon (i praksis daglig ansvarlig) sørge for at den behandlingen av personopplysninger som skjer i forbindelse med prosjektet er i overensstemmelse med det nye regelverket ved ikrafttredelsesdatoen. Særlig er det verdt å merke seg at forordningen stiller strengere krav til informasjon om de registrertes rettigheter. Det kan derfor være lurt å oppdatere informasjonsskrivet til deltakerne med disse rettighetene allerede nå – likevel med forbehold om at enkelte av rettighetene ikke kan gjøres gjeldende før regelverket trer i kraft. Kravene til dokumentasjon av at det foreligger et gyldig samtykke er også skjerpet. For mer informasjon om de nye personvernreglene, se Datatilsynets hjemmesider: https://www.datatilsynet.no/regelverk-og-skjema/nye-personvernregler/

Article 1

Winje, Ø., & Løndal, K. (2020). Bringing deep learning to the surface: A systematic mapping review of 48 years of research in primary and secondary education. *Nordic Journal of Comparative and International Education (NJCIE), 4*(2), 25-41.
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NJCIE 2020, Vol. 4(2), 25-41 https://doi.org/10.7577/njcie.3798

Bringing deep learning to the surface: A systematic mapping review of 48 years of research in primary and secondary education

Øystein Winje[1]
Ph.D. Candidate, Oslo Metropolitan University
Knut Løndal
Professor, Oslo Metropolitan University

Peer-reviewed article; received 26 March 2020; accepted 02 June 2020

Abstract

Deep learning is a key term in current educational discourses worldwide and used by researchers, policymakers, stakeholders, politicians, organisations and the media with different definitions and, consequently, much confusion about its meaning and usage. This *systematic mapping review* attempts to reduce this ambiguity by investigating the definitions of *deep learning* in 71 research publications on primary and secondary education from 1970 to 2018. The results show two conceptualisations of the term *deep learning*—1) *meaningful learning* and 2) *transfer of learning*—both based on cognitive learning perspectives. The term *deep learning* is used by researchers worldwide and is mainly investigated in the school subjects of science, languages and mathematics with samples of students between 13 and 16 years of age. *Deep learning* is also a prevalent term in current international education policy and national curriculum reform, thus deeply affecting the practice of teaching and learning in general education. Our review identifies a lack of studies investigating *deep learning* through perspectives other than cognitive learning theories and suggests that future research should emphasise applying embodied, affective, and social perspectives on learning in the wide array of school subjects, in lower primary education and in a variety of sociocultural contexts, to support the adaptation of *deep learning* to a general educational practice.

Keywords: deep learning**,** primary and secondary education, systematic mapping review

Introduction

Since the turn of the last century, policy documents and research reports concerning education have been advocating the need for students to learn and develop skills and knowledge to prepare for life in the rapidly changing society, both in the international (Dumont et al., 2010; Pellegrino & Hilton, 2012) and in the Norwegian (NOU 2014:7; NOU 2015:8) educational contexts. In particular, meaningful learning, digital competence, problem-solving ability, critical thinking and students' ability to transfer skills and knowledge from one context to another have been described as important. Consequently, this has led to an increase in both the development and revitalisation of terms describing these skills and knowledge sets. A frequent term used in this

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regard is *deep learning*. The term has been examined in *academic publications* (e.g., Bransford et al., 1999; Tochon, 2010; Ohlsson, 2011; National Academies of Sciences, Engineering, and Medicine, 2018; Østern et al., 2019), used in *political policy reports and documents* (e.g., Dumont et al., 2010; Pellegrino & Hilton, 2012; NOU 2014:7; NOU 2015:8) and highlighted in mainstream media coverage of education. However, with similar sounding terms like, e.g., *deep learning*, *deeper learning*, *in-depth learning*, *deep learning approach* and *deep level processing* all being part of the discourse, combined with partially overlapping and/or unclear definitions, there is confusion and uncertainty as to what the term *deep learning* actually means, its origin and its empirical support. Adding to the confusion, the term *deep learning* is also prevalent in discourses other than education, e.g., in research on artificial intelligence and machine-learning (Aizenberg et al., 2000; Dechter, 1986)

To obtain an overview of how *deep learning* is understood in research on *education* we made efforts to identify review-articles of *deep learning* in education. The only publication we could find was Beattie, Collins and McInnes' review article published in 1997, which provided an overview of the foremost research groups working with *deep learning* at that time. However, these research groups focused on learning in higher education, and the aim of the review was to provide an overview regarding *deep* and *surface learning* in the *accounting education literature*. We could not identify any publications providing a literature review of *deep learning* regarding *primary and secondary education*. This gap in the research literature is especially relevant since *deep learning* is gaining traction in current international and national education policies and reforms. In the OECD report *The Nature of Learning* (Dumont et al., 2010), *deep learning* is highlighted as an important educational concept to handle the demands of the "knowledge society" (p. 330), The American National Research Council's report *Education for Life and Work* (Pellegrino & Hilton, 2012) emphasises that *deeper learning* is crucial in developing 21st century competencies, while in Norway, the concept of *in-depth learning* has become a key term in the new curriculum (The Norwegian Directorate for Education and Training, 2020). An overview is needed of how *deep learning* and similar sounding terms (e.g., deeper learning, in-depth learning) are defined, which learning theories and perspectives these definitions are based on, and how they have been investigated in primary and secondary education.

Aim of study

In educational discourses there is a focus on changing education to provide children with the skills and knowledge needed to cope with the 21st century's demands, and *deep learning* is described as a key element in this regard. Subsequently, the aim of this article is to provide an overview of how *deep learning* is conceptualised in research on primary and secondary education. Due to the project's time and resource limitations we carried out a *systematic mapping review* rather than a *systematic literature review* (Grant & Booth, 2009), as our focus is to provide an overview of the *definitions* used, the *parts of the world* in which research has been conducted, and the *age ranges* and *school subjects* examined. We extract the definitions used and *synthesise*, *compare* and *thematise* them to provide an overview of key elements in the definitions as well as the learning theories and perspectives applied. The research questions that guide this *systematic mapping review* are as follows:

1. In what countries, sample age ranges, and school subjects have *deep learning* been investigated?
2. How is *deep learning* conceptualised and defined in research on primary and secondary education?

Theoretical perspectives

According to Beattie et al. (1997), the terms *deep* and *surface*, in relation to learning, were first described by Craik and Lockhart (1972) for investigating cognitive processing. From the 1970s, several research groups around the world worked on the distinction between *deep* and *surface learning*, with the former referring to learning with understanding and the latter referring to more temporary learning (Beattie et al., 1997).

A decisive contribution to the field of *deep learning* in education was Marton and Säljö's study of Swedish university students (1976a), which discovered that what a student intends to get out of learning determines whether a deep or surface approach will be used. The approach the student selects is a response to both a particular task and a particular context, underlining that an individual's study approach is flexible. This is regarded as one of the seminal studies of *deep learning* in education and contributed to the foundation of the theoretical model later known as *Student Approaches to Learning* (SAL).

According to Beattie et al. (1997) a *deep approach to learning* is shown by students who 1) seek to understand the meaning of the teaching materials, 2) relate ideas to their previous knowledge and experiences, and 3) examine the logic of the arguments and relate the evidence presented to the conclusions. Meanwhile, a *surface approach to learning* is characterised by students who 1) memorise parts of the content of the teaching materials and accept the material presented without questions, 2) concentrate on memorising facts rather than distinguishing any underlying principle or pattern, and 3) are influenced by assessments requirements.

After the early and large projects in the 1970s and '80s, the main research focus on *deep learning* in education has been on facilitation and assessment in higher education, while research of a more fundamental nature has been very limited (Beattie et al., 1997).

Tochon, professor in curriculum studies, suggests that *deep learning* (Marton & Säljö, 1976a, Entwistle & Wilson, 1977; Biggs, 1993), together with other perspectives like *deep teaching* (Tochon & Hanson, 2003; Hargreaves & Fink, 2006; Smith & Colby, 2007), *deep politics* (Gitlin, 2005), *deep education and philosophy* (Næss, 1989; O'Sullivan, 1999; Jardine, 2004) and *deep linguistics* (Chomsky, 1965; Lakoff, 1973), points towards 'the deep turning in education' (Tochon, 2010, p. 8). *Deep education* emphasises a holistic perspective including both the student and the teacher, working towards an ecological understanding *of* and responsibility *for* a sustainable future. A key element characterising this is an orientation towards meaning-making and transformative learning, including development of the students' identity.

Tochon (2010) claims that depth in education occurs when both students' and teachers' identities are activated, moved and given opportunity to understand their existence and their own role in relation to society and the world. He problematises that *deep learning* has mainly been investigated and described through *cognitive learning theory* and highlights that *deep learning* 'engages students intellectually, socially, and emotionally' and moves "beyond

temporary gains in achievement scores to create lasting, meaningful improvements in learning" (p. 5).

Dahl and Østern (2019), building on Tochon's (2010) ideas, emphasise the last thirty years of research in modern neuroscience and also questions the emphasis on cognitive perspectives regarding *deep learning*. The neurobiologist Damasio's (1994, 2000, 2010) research shows that when something happens outside of ourselves that we regard as an event, it affects us in an *embodied* way. Our entire body is affected by our brain through pre-reflective processes that affect blood circulation, intestines and muscle apparatus. We are permeated by affects, resulting in feelings that we can capture in words that we connect to the event. Actions are affective and emotionally anchored, and cognition emerges from the intra-action with the affects. As exemplified by Damasio's research, this provides opportunities to expand the understanding of learning beyond the cognitive perspective. He highlights that there are no clear lines separating the cognitive from the affective, social, and embodied aspects of learning. It is the *totality* of these aspects that, like Tochon's (2010) redefinition, that results in *deep learning*.

Deep learning can be understood *both* as students' approach to their learning material and as part of a deep turning in education. However, this does not necessarily mean that researchers investigating *deep learning* adhere to the ideas of the *deep education* "movement". This chapter shows that the theoretical framework purported by the SAL community seems to be the most prevalent theoretical understanding of *deep learning* regarding education, and thus also provides the basic theoretical framework for this mapping review. However, as described above, we are aware that there are variations as to how *deep learning* is understood and applied in the educational discourses worldwide and we will in the subsequent analysis of the data be sensitive as to these variations.

Method

This worldwide review draws on procedures defined in the literature on systematic literature reviews and research synthesis (Grant & Booth, 2009; Moher et al., 2015; Gough et al., 2017). Firstly, we carry out a *systematic mapping review* (Grant & Booth, 2009) with the intention of creating a worldwide *map of the empirical research* that has been undertaken on *deep learning* in primary and secondary education. We extract data elements regarding the geographical prevalence, the age range of the participants and the school subjects investigated and carry out a quantitative analysis of these elements to provide an overview. Secondly, we carry out a qualitative analysis where we *extract, analyse, synthesise, categorise and thematise* the definitions of *deep learning* to gain overview of the learning theories and perspectives that are prevalent in the conceptualisations. Hopefully, in doing so, we can contribute to inform discussions on what future research might usefully address regarding *deep learning* in primary and secondary education. We provide no formal quality assessment of the publications apart from identifying that they are scientific and peer reviewed. A protocol for the review was developed using the *Preferred Reporting Items for Systematic review and Meta-Analysis Protocols* checklist (Moher et al., 2015) and involved planning and documenting every step of the review process before the actual review was conducted.

Search strategy

Deep learning has become a generic term that covers a range of different component processes undertaken in different contexts for different aims (Dumont et al., 2010; Pellegrino & Hilton, 2012). An initial search for research publications was conducted, and we also examined a selection of central international and national grey literature (Dumont et al., 2010; Pellegrino & Hilton, 2012; NOU 2014:7; NOU 2015:8) to gain an overview of similar terms used in more contemporary publications. This initial search enabled the identification of several focus points and terms considered important for the definition of the core search terms. The authors discussed the initial search and decided to operationalise *deep learning* by including several variations of the term. We also wanted to investigate connections between *deep learning* and other terms and included terms that, in the grey literature, appeared to be closely connected to *deep learning*. The following list of core search terms was used in the search string: *deep learning*, *deeper learning*, *in-depth learning*, *in depth learning*, *deep level processing*, *transfer of learning*, *adaptive expertise*, *21st century skills*, *21st century knowledge*, and *21st century competencies* (see *supplementary material 1 for search documentation*).

Because the possibilities for filtering searches differ among databases, we found it necessary to develop a second search string. This string consisted of core search terms defining the *primary and secondary education* context we were interested in identifying research related to (see *supplementary material 1 for search documentation*). Both search strings were created in cooperation with an educational sciences librarian and were adapted to suit the different database interfaces, but the text words were identical in each search. The search included the text words from the *title*, *subject descriptions*, *key words*, and *abstract*. The search for international articles was conducted in *Education Resources Information Centre* (ERIC), *Education Source* and *Scopus* databases and was limited to peer-reviewed articles published between 1970 and 2018. The search was conducted on in January 2018, and we decided on 1970 as the starting point because according to Beattie et al. (1997), the terms *deep* and *surface*, in relation to learning, were first described by Craik and Lockhart in 1972. The first two databases are disciplinary topic–specific bibliographic databases that focus on education, while the third is interdisciplinary, which enables the identification of key studies of interest published in other disciplines.

Inclusion and exclusion criteria

The inclusion and exclusion criteria are described in *table 1*. When considering the eligibility of publications for this review we had no restrictions regarding the study design or sample size. Due to limited time resources and scope of this review on primary and secondary education both studies with samples from special education and higher education were excluded. Since the method of systematic mapping review does not entail an exhaustive search (Grant & Booth, 2009), we decided to use search terms in the English language only, and an abstract in English was required to be considered for inclusion. Publications that provided an abstract in English but was written in a language neither of the authors were proficient in would if deemed eligible, be considered by a colleague proficient in that language.

Table 1. Inclusion and exclusion criteria

Type of criterion	Criteria	Inclusion	Exclusion
Type of publication	Journal articles	X	
	Conference papers		X
	Reports		X
	Dissertations		X
	Books		X
Access	Online	X	
	Paper	X	
Publication period	January 1970–January 2018	X	
Place of study	Worldwide	X	
Type of study	Empirical investigation	X	
	Literature reviews	X	
	Theoretical studies	X	
Research method	Qualitative	X	
	Quantitative	X	
	Mixed method	X	
Language	English	X	
Education level	Primary education	X	
	Secondary education	X	
	Special education		X
	Higher education		X
Key term in the title or abstract (topic)	Deep learning	X	
	Deep-level processing	X	
	Deeper learning	X	
	In-depth learning	X	
	In-depth learning	X	
	Adaptive expertise	X	
	Transfer of learning	X	
	21st century skills	X	
	21st century competencies	X	
	21st century knowledge	X	
Definition of the key term in full text	Definition in the full text	X	
	No definition in the full text		X

The first search resulted in 812 hits on ERIC, 614 hits on Education Source and 415 hits on Scopus, for a total of 1841 publications (see *supplementary material 1*). After the removal of duplicates, 1303 publications were first assessed for eligibility at the title and abstract levels. Eligibility disagreements were resolved through discussion between the first and second author. As a calibration exercise 100 abstracts were assessed by the first and second author to pilot and refine the criteria. After the calibration exercise both authors conducted independent, blind screenings of the titles and abstracts against the inclusion criteria (Gough et al., 2017). The publications deemed ineligible in the first screening phase were excluded for the reasons shown in table 2.

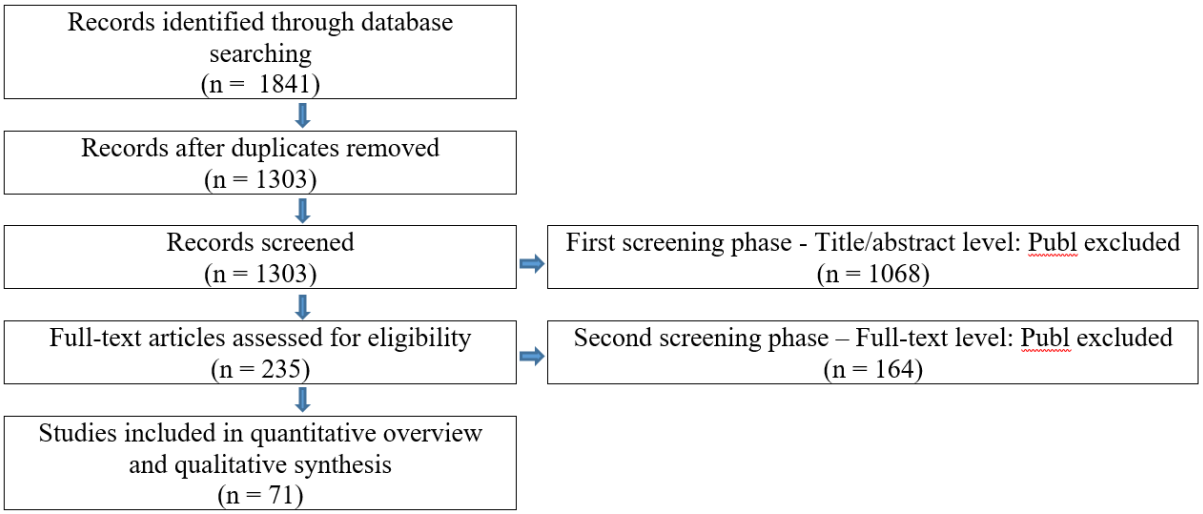
Table 2: Papers excluded in first screening phase

Total number of publications	**1303**
Not empirical	430
Not on topic	364
Not primary or secondary education	260
Not journal article	14
Total excluded in first screening phase	**1068**
Publications eligible for second screening phase	**235**

In the second screening phase, the full texts of the remaining 235 publications were read, focussing on identifying the definition of the key term in the publication—e.g., *deep learning*,

adaptive expertise, *21st century skills*—and identifying a possible connection between the key term in the study and *deep learning*. If the publication did not contain a definition of *deep learning* or did not describe a connection between the key term and *deep learning*, the publication was excluded. In our preliminary search for relevant key terms, we read several central grey literature publications highlighting *deep learning*. Common to these publications were descriptions of connections or similarities between *deep learning* and terms like *21st century skills*, *adaptive expertise* and *transfer of learning*. We identified 3 studies examining *21st century skills/knowledge/competencies* in the context of primary and secondary education and 3 studies examining *adaptive expertise*. These studies were read in full text, but none of these publications described a relationship between their key term and *deep learning*. Therefore, they were not included in the final categorisation. We identified 60 studies examining *transfer of learning* in primary and secondary education and all were read in full text. Of the 60 studies focussing on *transfer of learning*, only three describe a connection with *deep learning*, and only these three were therefore included. In the second screening phase, 164 of the publications were excluded. We assessed 1303 publications for eligibility in this review and 71 were included. See *figure 1* for an overview of the stages of the eligibility assessment.

Figure 1: Flow diagram illustrating the stages of the eligibility assessment



Data extraction and analysis

The analyses of the 71 publications deemed eligible was performed in two steps, both followed by a discussion between the authors. In *the first step*, a coding scheme inspired by the work of Gough and colleagues (2017) and Prøitz et al. (2017) was applied to the included publications. The data were extracted, coded and categorised in QSR NVivo 12, and the included studies were coded with the following descriptive variables: *year of publication*, *first author's country of affiliation*, *age range of the participants*, *school subject* and *definitions of key terms*. *In the second step*, the extracted paragraphs defining and describing the study's definitions of *deep learning* and the possible connections to other terms were analysed to facilitate the qualitative identification and interpretation of patterns in the definitions. Applying a *conventional content analysis* on the extracted definitions, we avoided preconceived categories but relied on

inductive categories with close similarity to the empirical material (Braun & Clarke, 2006). As an example of the analysis, we will use an extracted paragraph from Chin and Brown (2000):

> In essence, the deep approach is associated with intrinsic motivation and interest in the content of the task, a focus on understanding the meaning of the learning material, an attempt to relate parts to each other, new ideas to previous knowledge, and concepts to everyday experiences (p. 110).

In this paragraph we identified three main elements: *intrinsic motivation*, *meaning* and *relating*. The extracted paragraphs of all the included publications were analysed, synthesised and categorised in this way, providing an overview of the key elements in each definition. See *supplementary material 2* for an overview of the key elements found in each publication.

Results

The 71 publications included were published from 1994 to January 2018 and reflect a considerable recent rise in the frequency of publications on *deep learning* in primary and secondary education. No studies were identified in the period from 1970 until 1993, 35 studies were published from 1994 until 2012, and 36 publications were published during the last five years of the study period (2013–2018). *Deep learning* has been investigated in Asia (35), Europe (22), North America (10), Oceania (8), Africa (2) and South America (1). The age range of the participants in the reviewed studies is 8 to 23[2] years, and the mean ages range from 13–16 years. The studies focus on the school subject's *science* (23), *languages* (15) or *mathematics* (13), often in combination, whereas 19 publications focus on students' learning approaches or motivation for schoolwork independent of the school subject. *Social science* (8), *computer science* (4), *art* (2), *vocational subjects* (1) and *religion* (1) are examined by some publications. For an overview of the included studies, see *supplementary material 2*.

The analyses yielded two main categories across the 71 publications based on a synthesis of the definitions of the key word:

- The first and largest category consists of 63 publications defining *deep learning as meaningful learning*.
- The second category consists of 5 publications that define *deep learning as transfer of learning* and 3 publications focussing on *transfer of learning* that describe a connection between *transfer of learning* and *deep learning*.

Deep learning as meaningful learning

This category consists of 63 studies, and three elements comprise the core of the conceptual definition of *deep learning*: 1) *meaning*, 2) *relating*, and 3) *intrinsic motivation*. Moreover, they are often used in combination. All publications contain either *meaning* or *relating* or both, and we chose to name the category *meaningful learning.*

Fifty-eight of the 63 studies in this category refer to one, or several, of the seminal studies of deep learning from the 1970s and 1980s when defining *deep learning*—e.g., Marton and Säljö (1976a), Biggs (1987, 1993) or Entwistle and Ramsden (1983)—clearly highlighting a

[2] Two publications report participants above the age of 20, Janeiro et al. (2017) report participants age range between 15 and 21 and Wishart & Triggs (2010) report participants age range between 11 and 23.

connection with the conceptual framework of *Student Approaches to Learning* (SAL). Five of the studies included in this category do not refer to any of these publications, but they use the terms *deep learning* (Liem, Ginns, Martin, Stone, & Herrett, 2012; van Aalst, Hing, May, & Yan, 2007), *deep-level learning strategies* (Matos et al., 2017), *deep processing strategies* (Chou, 2017) and *deep cognitive learning strategies* (Şen, 2016). However, the main elements in the definitions in these five publications are clearly similar to the definitions of the 58 other publications in this category. The former are likewise connected to the same conceptual framework and are categorised similarly.

The most prevalent element, which features in 52 of the studies' definitions, is that learners look for *meaning* in the learning material to gain an understanding. In some of the definitions, the meaning element is contrasted with *rote memorising*, which is often described a defining feature of *surface learning*. Dahlin and Watkins (2000) provide a typical example of a definition focussing on how students might approach the learning material on different levels:

> Central to this position are the concepts of a surface approach where the learner focuses on 'the sign', the learning material itself, and a deep approach where the focus is on 'the signified', that is beyond the sign to that to which the material refers (p. 66).

Learners who reproduce, replicate and memorise signs, for example, by learning a piece of text by rote, use a *surface learning* approach. Learners who seek to understand the intention of the learning material use a *deep learning* approach.

Thirty-eight studies describe students *relating* new knowledge to previously acquired knowledge and to their everyday experience as a defining feature of *deep learning*. Chin and Brown (2000) give a typical definition that describes different levels of relating: *"(…) an attempt to relate parts to each other, new ideas to previous knowledge, and concepts to everyday experiences*" (p. 110). Accordingly, students who use a *deep learning* approach strive to attain coherence between the different parts of the learning material, between the new information and what they already know, and between the school context and their experience outside of school.

Twenty-three studies highlight students' *intrinsic motivation* as a main feature of a *deep learning* approach, emphasising a learners' interest in the learning material that is driven by their own interest rather than by an external motivation. Some publications state that the two elements of searching for *meaning* and *relating* should be regarded as *deep learning strategies* and that *intrinsic motivation* is the motivational component of a *deep learning* approach. The definition in Cano's study (2007) is an example in which all three core elements are present with a clear distinction between motivation and strategy:

> By contrast, the motivation of those deploying a deep approach tends to be intrinsic (they strive to understand the author's intent and seek self-fulfilment from the material). Their strategy is more meaningful (searching for meaning, integrating formal knowledge with personal experience, and relating facts to conclusions) (p. 132).

We found some other features of *deep learning* used in defining the term that are worth highlighting (see *supplementary material 2* for overview). Ten of the studies include *critical thinking* in their definitions, but generally without a further explanation of what critical thinking entails. Seven studies add *metacognitive strategies* to their definitions. Six studies include

application of knowledge, four of these specify that the application must be to a novel situation. Four studies describe *long-term retention*, i.e., students' ability to retain knowledge for a long time, as an important aspect. Three studies include *transformation* as part of their definitions, referring to students transforming the learning material.

Thirty-two of the studies in this category investigate pupils attending school in Asia, 21 in Europe, 8 in Oceania, 4 in North America, 2 in Africa and one in South America. The pupils in the studies were mainly between 13 and 16 years of age, with some as young as eight years old and others as old as 23 years old. The school subject contexts of these studies were mainly *science*, *languages* and *mathematics*.

Two publications in this category mention a connection between *deep learning* and *transfer of learning*, i.e., how knowledge or skills acquired from one task or situation can be applied to a novel task or situation. Alkharusi (2013) notes that, from the standpoint of assessment, transferring to authentic tasks demands a higher emphasis on understanding and thus requires *deep learning*. Munowenyu (2007) suggests that *deep learning* also enhances the development of transferable skills. The six studies that include *application of knowledge* in their definitions display clear similarities with the definitions of the term *transfer of learning*; however, they do not explicitly use this term.

Deep learning as transfer of learning

This category consists of eight publications. All publications in this category describe a relationship between *deep learning* and *transfer of learning*. Five of them define *deep learning as transfer of learning*, while three describe *deep initial learning* as a requisite for subsequent *transfer of learning*.

The origin of the term *transfer of learning* dates back to the beginning of the 20th century when seminal studies in the field of educational psychology investigated whether improvement in one mental function would influence the efficiency of other functions (Bransford et al., 1999). For example, studies tested the doctrine of "formal discipline", e.g., if practicing and learning Latin or other difficult subjects had broad-based effects, such as developing the general skills of learning and attention.

First, we report on the five publications using *deep learning* as a key term, and second, we report on the three publications that focus on *transfer of learning* that suggest a connection between *deep learning* and *transfer of learning*.

We synthesised the content of the definitions of the five publications using *deep learning* as *the learning process leading to transfer of learning to a novel situation*. These publications explicitly refer to research on *transfer of learning* when defining *deep learning*. Two of the publications, Grover and colleagues (2015) and Nehring and Szczesiulc (2015), use the term *deeper learning* and define it by referring to a United States Research Council report (Pellegrino & Hilton, 2012): '*the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations'* (Nehring & Szczesiul, 2015, p. 332). Both studies describe how the skills and knowledge needed to transfer learning from one situation to another can be divided into three domains, namely, the *cognitive*, *interpersonal* and *intrapersonal*, and these skills are referred to as *21st century competencies*. The *cognitive domain* includes critical thinking, information literacy, reasoning and argumentation, and

innovation. The *interpersonal domain* includes teamwork, collaboration and leadership. The *intrapersonal domain* includes intellectual openness, work ethic and conscientiousness, and positive core self-evaluation. These competencies are described as the blend of knowledge and skill that create an individual's capacity to understand how, why, and when to apply domain-specific knowledge.

Three publications in this category, Parker and colleagues (2011; 2013; 2017) describe *deep learning* as learning for *adaptive transfer*:

> …a kind of deep learning that we call adaptive, flexible or transferable. Following Bransford and Schwartz (2000) and Hatano and Inagaki (1986), we take an understanding to be deep when it is both complex and adaptable; that is, when it is differentiated (composed of diverse cases or problems) and elaborated (much can be said about each case), yet integrated (coherent, it all hangs together) and flexible (is useable in novel problems later) (Parker et al., 2017, p. 255).

According to this quote, *deeper learning* means that students' understanding is differentiated, elaborated, integrated and flexible.

The remaining three publications in this category investigate *transfer of learning* in primary and secondary education but describe a connection with *deep learning*. All three studies underline that *deep initial learning* is necessary for the subsequent transfer of learning to a novel context (Pugh et al., 2014; Schiff & Vakil, 2014; Grotzer et al., 2015).

The eight publications in this category were published between 2011 and 2017. Six of the eight studies investigate pupils attending school in United States, while one study reports on schools in Northern Ireland and one on schools in Israel. The pupils were between 8 and 18 years old, and the school subject contexts included *science*, *computer science*, *social science* and *mathematics*.

In all, 10 of the publications included in this review mention a connection between *deep learning* and *transfer of learning;* 8 in this category and two in the *meaningful learning* category. However, this connection is not emphasised by the majority of the studies investigating *deep learning*.

Discussion

Our systematic mapping review of *deep learning* in primary and secondary education shows that the term is conceptualised in two main ways: 1) *deep learning as meaningful learning* and 2) *deep learning as transfer of learning*.

Conceptualisations of deep learning

The publications defining *deep learning as meaningful learning* refer to research on *Student Approaches to Learning* (SAL) and show a clear connection between the publications using this definition and the seminal studies of *deep learning* from the 1970s and 1980s. In general, we find a large degree of similarity in the literature review published by Beattie et al. (1997) and our review regarding how *deep learning* is characterised in the publications. We find that two of the elements, *meaning* and *relating*, either individually or together, feature in the majority of definitions of *deep learning* in our review. However, the third element Beattie and colleagues (1997) highlights, the examination of the logic of the arguments, is not found to the

same degree in our review, although some of the publications mention *critical thinking* as a characteristic trait.

The second conceptualisation of *deep learning* identified in our review is through *deep learning as transfer of learning*, defined as "*the learning process leading to transfer of learning to a novel situation*". All five publications using this definition are published after 2009, indicating that this conceptualisation of *deep learning* is fairly new in the field of primary and secondary education. The term *transfer of learning* has been part of the field of education since the beginning of the 1900's, when Woodworth and Thorndike (1901) investigated the *transfer of learning* between an original learning context and a novel situation, disputing the idea of *formal discipline*. However, the conceptualisation of *deep learning as transfer of learning* might be understood as a development or re-emergence of the term *transfer of learning*.

We find it difficult to establish if the publications that define *deep learning* as *transfer of learning* and the publications that claim that *deep learning* is a requisite for transfer share the same understanding of the relationship between the two terms. We suggest that the relationship between *deep learning* and *transfer of learning* should be investigated and elaborated on in future research.

This review finds that both conceptualisations of *deep learning* in research on primary and secondary education—1) *meaningful learning* and 2) *transfer of learning*—are defined from perspectives related to *cognitive learning theory*. This finding supports Tochon's (2010) argument that research on *deep learning* has mainly focused on it as a cognitive phenomenon. However, Tochon outlines a much broader, multi-disciplinary turn concerning depth in education, highlighting that *deep education* concerns the whole person and implies a sense of purpose and deep transformational learning, affecting identity and how students see their role in relation to the world, especially regarding ecological understanding and the responsibility for a sustainable future, which is of the utmost importance in the global society. He argues that there is a need for research that incorporates embodied, affective and social aspects of learning to expand how *deep learning* is conceptualised. Dahl and Østern (2019) suggest that the way out of a too-narrow cognitive focus on *deep learning* might be, contrary to expectation, by directing attention to recent developments in cognitive sciences, especially *neurosciences*. Damasios' (1994, 2000, 2010) studies on the connections between emotions and rationality (*somatic marker hypothesis*); Kandel's (2006) studies on the physiological basis of memory storage in neurons (*synaptic growth*); and Rizzolatti and Singaglia's (2008) studies of the connections between perception, memory and action (*mirror neurons*) all point to learning as a process that fundamentally involves embodied, affective, social and cognitive aspects. These aspects should all be considered when investigating *deep learning* in the context of primary and secondary education in future research.

Deep learning in different sociocultural contexts

We found that studies of *deep learning* investigate pupils all over the world and apply similar definitions across different sociocultural contexts. However, Chan (2008) pinpoints that, from a Western viewpoint, *memorisation* and *understanding* are often investigated as distinctive and polarised constructs, while, from an Eastern viewpoint, these constructs are viewed as intertwined. This disparity results in what she describes as "the paradox of the Chinese learner"

(p. 235), in which Chinese students take a deep approach to learning even though they use memorisation strategies. She also suggests that the psychological constructs used in the West cannot explain Chinese students' performance adequately because teaching and learning need to be interpreted in relation to sociocultural influences and systems perspectives. Future research should consider these perspectives, especially regarding how *understanding* is understood across different cultures and in the transfer and adaptation of research findings regarding *deep learning* across different educational systems.

School subjects examined

This review finds that the majority of the studies focus on examining *science*, *language* and *mathematics*, but only two studies (Dart et al., 1999; Dart et al., 2000) mention a *practical aesthetic subject* (PAS) as part of the study's focus, the subject being *art*. According to Borgen and Hjardemaal (2017), compulsory education internationally makes certain assertions about PAS. The focus seems to be on PAS capacity to improve academic performance in other subjects—like *languages*, *mathematics* and *science*—and to contribute to moral development, health and psychological wellbeing in a life-long perspective. These subjects are not included in the Organisation for Economic Co-operation and Development Program for International Student Assessment surveys or in the empirical research that has examined school performance and learning outcomes. This situation places PAS in the discourse of education both as important subjects and as fundamentally different from other school subjects. One of the main characteristics of PAS is the focus on embodied, affective and social aspects of learning. In PAS—like *Physical Education*, *Arts and Crafts* and *Music*—the students' application of their bodies, feelings and social interactions are central to the learning outcomes. We suggest that PAS should be included in future research regarding *deep learning* to ascertain a more holistic understanding of the interactions between the embodied, affective, social and cognitive aspects of learning.

Age ranges examined

The seminal studies of *deep learning* from the '70s and '80s focused on students' approaches to learning (SAL) in higher education (Beattie et al., 1997). This review finds that the participants in the studies on *deep learning* in primary and secondary education are, on average, between 13 to 16 years old. Only 4 of the included publications investigate *deep learning* in students that are under 10 years old. This result begs the question whether *deep learning* primarily is understood as a concept relevant for children above this age. Dahl and Østern (2019) point out that the aims of higher education and those of general compulsory education differ. Moreover, they note that the adaptation of *deep learning* from the context of higher education to that of general education, e.g., in the recent Norwegian curriculum reform, entails a 'twist' (p. 47). *Deep learning*, a concept that has been developed in relation to adults' learning of theoretical knowledge (Beattie et al., 1997), has now, seemingly without resistance, been placed as central to children's and youths' learning (Dahl & Østern, 2019). Consequently, the lack of research on *deep learning* in the lower age ranges of primary education needs to be addressed.

Concluding remarks

Our study show that two main conceptualisations of *deep learning* have emerged around the world during the last five decades of research on primary and secondary education: *meaningful learning* and *transfer of learning*. The first is conceptualised as students' approach 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. The other is conceptualised as students' ability to *transfer skills and knowledge* to a novel context.

The current educational discourse highlights a need for a change in the educational system that can provide students with the skills and knowledge needed to cope with the demands of the 21st century, and *deep learning* is proposed to be an important feature. Our review finds that research on *deep learning* in primary and secondary education conceptualises *deep learning* as a cognitive phenomenon investigated among teenagers in relation to a few school subjects. However, applying a concept that has been investigated with such a narrow scope as a key feature in in the curriculum of compulsory education might result in an understanding of *learning* simply as *cognitive learning* among politicians, policymakers, school leaders, teachers, students and parents. This might lead to a focus on facilitating a teaching practice based solely on this understanding. As highlighted by researchers like Tochon (2010), Dahl and Østern (2019) and Damasio (1994; 2000; 2010), *embodied*, *emotional* and *social* aspects of learning are fundamental and need to be considered together with the *cognitive* aspects. Biesta (2010) describes a prevalent trend in education focussing on educational practice. He accentuates that a possible consequence of focussing solely on practice, is that the overall aims and purposes of education and its guiding values is neglected by favouring a focus on 'what works' (p. 493). We see a similar tendency in the discussion concerning *deep learning* and which skills and knowledge are needed to cope with the 21st century. In policy documents there seems to be a heavy focus on implementing practices like *deep learning* to facilitate, e.g., *critical thinking*, *problem-solving* and *transfer of learning*, without necessarily revising the content and direction of education overall. Are the current aims and purposes of education sustainable for a future where phenomena like globalisation, digitalisation, climate change and pandemics affect our way of living in unforeseen ways? We believe that Tochon's (2010) idea of *deep education* is an interesting starting point for discussions regarding the direction of education in the 21st century. Future research on *deep learning* should apply a broad range of perspectives, including embodied, emotional, social and cognitive aspects of learning, and investigate *deep learning* in all age ranges and all school subjects. In addition, the perceived differences between Eastern and Western educational contexts should be considered, and the relationship between *deep learning* and *transfer of learning* should be elaborated.

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Supplementary material 1: Search documentation

Search documentation – Education Resources Information Centre (ERIC) – 31.1.2018

#	Query	Limiters/Expanders	Last Run Via	Results
S5	S1 AND S2	Limiters - Peer Reviewed; Date Published: 19700101-20171231 Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - ERIC	812
S4	S1 AND S2	Limiters - Date Published: 19700101-20171231 Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - ERIC	1,850
S3	S1 AND S2	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - ERIC	1,877
S2	TI ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR school*)) OR ((high OR “junior high” OR middle) N2 (school*)) OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”)) OR SU ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen -	616,696

	school*)) OR ((high OR “junior high” OR middle) N2 (school*)) OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”)) OR KW ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR school*)) OR ((high OR “junior high” OR middle) N2 (school*)) OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”)) OR AB ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR school*)) OR ((high OR “junior high” OR middle) N2 (school*)) OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”))		Advanced Search Database - ERIC	
S1	TI (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies)))) OR SU (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies)))) OR KW (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies)))) OR AB (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies))))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - ERIC	4,817

Search documentation – Education Source – 31.1.18

#	Query	Limiters/Expanders	Last Run Via	Results
S5	S1 AND S2	Limiters - Scholarly (Peer Reviewed) Journals; Published Date: 19710101-20181231 Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - Education Source	614
S4	S1 AND S2	Limiters - Published Date: 19700101-20181231 Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - Education Source	880
S3	S1 AND S2	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - Education Source	885
S2	TI ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR school*)) OR ((high OR “junior high” OR middle) N2 (school*)) OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”)) OR AB ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR school*)) OR ((high OR “junior high” OR middle) N2 (school*))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search	400,115

	OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”)) OR SU ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR school*)) OR ((high OR “junior high” OR middle) N2 (school*)) OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”)) OR KW ((((elementary OR “elementary secondary” OR primary OR secondary) N2 (education* OR school*)) OR ((high OR “junior high” OR middle) N2 (school*)) OR “high school equivalency program*" OR "intermediate grade*" OR “K12” OR “K-12” OR “Grade 1” OR “Grade 2” OR “Grade 3” OR “Grade 4” OR “Grade 5” OR “Grade 6” OR “Grade 7” OR “Grade 8” OR “Grade 9” OR “Grade 10” OR “Grade 11” OR “Grade 12”))		Database - Education Source	
S1	TI (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies)))) OR AB (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies)))) OR SU (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies)))) OR KW (((((Deep* OR “in depth” OR “in-depth” OR transfer) N2 (learning)) OR “deep level processing” OR “adaptive expertise”) OR ((“21st century”) N2 (skills OR learning OR knowledge OR competencies))))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - Education Source	5,995

Search documentation – Scopus – 31.1.18

5	(TITLE-ABS-KEY ((((deep* OR "in depth" OR "in-depth" OR transfer) W/2 (learning)) OR "deep level processing" OR "adaptive expertise") OR (("21st century") W/2 (skills OR learning OR knowledge OR competencies)))) AND (TITLE-ABS-KEY (((elementary OR "elementary secondary" OR primary OR secondary) W/2 (education* OR school*)) OR ((high OR "junior high" OR middle) W/2 (school*)) OR "high school equivalency program*" OR "intermediate grade*" OR "K12" OR "K-12" OR "Grade 1" OR "Grade 2" OR "Grade 3" OR "Grade 4" OR "Grade 5" OR "Grade 6" OR "Grade 7" OR "Grade 8" OR "Grade 9" OR "Grade 10" OR "Grade 11" OR "Grade 12")) AND (LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2004) OR LIMIT-TO (PUBYEAR , 2003) OR LIMIT-TO (PUBYEAR , 2002) OR LIMIT-TO (PUBYEAR , 2001) OR LIMIT-TO (PUBYEAR , 2000) OR LIMIT-TO (PUBYEAR , 1999) OR LIMIT-TO (PUBYEAR , 1998) OR LIMIT-TO (PUBYEAR , 1997) OR LIMIT-TO (PUBYEAR , 1996) OR LIMIT-TO (PUBYEAR , 1995) OR LIMIT-TO (PUBYEAR , 1994) OR LIMIT-TO (PUBYEAR , 1988) OR LIMIT-TO (PUBYEAR , 1985) OR LIMIT-TO (PUBYEAR , 1983) OR LIMIT-TO (PUBYEAR , 1978) OR LIMIT-TO (PUBYEAR , 1976)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "ip"))	415 document results	
4	(TITLE-ABS-KEY ((((deep* OR "in depth" OR "in-depth" OR transfer) W/2 (learning)) OR "deep level processing" OR "adaptive expertise") OR (("21st century") W/2 (skills OR learning OR knowledge OR competencies)))) AND (TITLE-ABS-KEY (((elementary OR "elementary secondary" OR primary OR secondary) W/2 (education* OR school*)) OR ((high OR "junior high" OR middle) W/2 (school*)) OR "high school equivalency program*" OR "intermediate grade*" OR "K12" OR "K-12" OR "Grade 1" OR "Grade 2" OR "Grade 3" OR "Grade 4" OR "Grade 5" OR "Grade 6" OR "Grade 7" OR "Grade 8" OR "Grade 9" OR "Grade 10" OR "Grade	656 document results	

	11" OR "Grade 12")) AND (LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2004) OR LIMIT-TO (PUBYEAR , 2003) OR LIMIT-TO (PUBYEAR , 2002) OR LIMIT-TO (PUBYEAR , 2001) OR LIMIT-TO (PUBYEAR , 2000) OR LIMIT-TO (PUBYEAR , 1999) OR LIMIT-TO (PUBYEAR , 1998) OR LIMIT-TO (PUBYEAR , 1997) OR LIMIT-TO (PUBYEAR , 1996) OR LIMIT-TO (PUBYEAR , 1995) OR LIMIT-TO (PUBYEAR , 1994) OR LIMIT-TO (PUBYEAR , 1988) OR LIMIT-TO (PUBYEAR , 1985) OR LIMIT-TO (PUBYEAR , 1983) OR LIMIT-TO (PUBYEAR , 1978) OR LIMIT-TO (PUBYEAR , 1976))		
3	(TITLE-ABS-KEY ((((deep* OR "in depth" OR "in-depth" OR transfer) W/2 (learning)) OR "deep level processing" OR "adaptive expertise") OR (("21st century") W/2 (skills OR learning OR knowledge OR competencies)))) AND (TITLE-ABS-KEY (((elementary OR "elementary secondary" OR primary OR secondary) W/2 (education* OR school*)) OR ((high OR "junior high" OR middle) W/2 (school*)) OR "high school equivalency program*" OR "intermediate grade*" OR "K12" OR "K-12" OR "Grade 1" OR "Grade 2" OR "Grade 3" OR "Grade 4" OR "Grade 5" OR "Grade 6" OR "Grade 7" OR "Grade 8" OR "Grade 9" OR "Grade 10" OR "Grade 11" OR "Grade 12"))	663 document results	
2	TITLE-ABS-KEY (((elementary OR "elementary secondary" OR primary OR secondary) W/2 (education* OR school*)) OR ((high OR "junior high" OR middle) W/2 (school*)) OR "high school equivalency program*" OR "intermediate grade*" OR "K12" OR "K-12" OR "Grade 1" OR "Grade 2" OR "Grade 3" OR "Grade 4" OR "Grade 5" OR "Grade 6" OR "Grade 7" OR "Grade 8" OR "Grade 9" OR "Grade 10" OR "Grade 11" OR "Grade 12")	316,312 document results	
1	TITLE-ABS-KEY ((((deep* OR "in depth" OR "in-depth" OR transfer) W/2 (learning)) OR "deep level processing" OR "adaptive expertise") OR (("21st century") W/2 (skills OR learning OR knowledge OR competencies)))	22,865 document results	

Supplementary material 2: Overview included studies

						Key elements in definition			
No	**Author**	**Key term**	**School Subject**	**Sample age range**	**Country**	**Meaning**	**Relating**	**Intrinsic motivation**	**Other**
1	Aharony (2006)	Deep Learning Approach	Languages	12-18	Israel	x	x		Metacognitive strategies
2	Alkharusi (2013)	Deep Learning Strategies	Languages	15-17	Oman		x		Critical thinking
3	Baas et al. (2015)	Deep-level learning strategies	Not reported	9-12	The Netherlands	x			Application of knowledge
4	Beausaert et al. (2013)	Deep-approach to learning	Languages and Math	12-18	The Netherlands	x	x	x	
5	Blom and Severiens (2008)	Deep Learning	Languages and Math	15-16	The Netherlands	x			Critical thinking
6	Burnett and Proctor (2002)	Deep approach to learning	Languages and Math	10-12	Australia	x	x		Transformation
7	Burnett et al. (2003)	Deep learning	Not reported	12-20	Australia	x			
8	Campbell et al. (2001)	Deep approach to learning	Not reported	11-16	Australia	x	x		
9	Cano (2007)	Deep approach to learning	Not reported	16-17	Spain	x	x	x	
10	Cano and Cardelle-Elawar (2004)	Deep learning conception	Not reported	11-16	Spain	x			
11	Chan (2008)	Deep learning approaches	Science	12-17	Hong Kong	x			
12	Chan and Chan (2011)	Deep approach to learning	Not reported	12-17	Hong Kong	x	x	x	
13	Cheung (2014)	Deep learning strategies	Science	16-18	Hong Kong	x			Metacognitive strategies, Critical thinking
14	Cheung and Lai (2013)	Deep learning strategies	Not reported	16-17	Hong Kong	x			Metacognitive strategies, Critical thinking
15	Chin and Brown (2000)	Deep approach	Science	13-14	USA	x	x	x	
16	Chiou and Liang (2012)	Deep approach to learning	Science	16-17	Taiwan	x	x	x	
17	Chiou et al. (2013)	Deep approach to learning	Science	15-18	Taiwan	x	x	x	
18	Chou (2017)	Deep processing strategies	Languages	17-18	Taiwan	x			Metacognitive strategies
19	Chu et al. (2010)	Deep approach to learning	Computer Science	8-12	Hong Kong	x	x	x	
20	Çolak and Cirik (2016)	Deep learning	Not reported	14-15	Turkey	x			Long-term retention
21	Dahlin and Watkins (2000)	Deep approach to learning	Not reported	15-18	Hong Kong	x			
22	Dan and Todd (2014)	Deep-learning strategies	Social Science	12-13	China	x	x	x	
23	Dart et al. (2000)	Deep learning approach	Math, Science, Social Science, Languages, Art	11-16	Australia	x			Transformation
24	Dart et al. (1999)	Deep approach to learning	Math, Science, Languages, Art	11-16	Australia	x			Transformation
25	Elstad et al. (2012)	Deep learning approach	Science	16-18	Norway	x	x		
26	García et al. (2015)	Deep learning approach	Math	10-13	Spain		x		
27	Goto et al. (2018)	Deep learning approach	Science	8-15	Japan	x			
28	Göçmençelebi et al. (2012)	Deep learning	Science	10-13	Turkey	x	x		Long-term retention, Application of knowledge
29	Hii and Fong (2010)	Deep approach to learning	Social Science	13-14	Malaysia	x	x	x	
30	Ho and Liang (2015)	Deep motive in learning	Science	15-18	Taiwan	x		x	
31	Janeiro et al. (2017)	Deep approach to learning	Not reported	15-21	Portugal	x		x	
32	Kirby and Woodhouse (1994)	Deep approach to learning	Not reported	Not reported	Canada/Not reported	x		x	
33	Kong and Hau (1996)	Deep approach to learning	Not reported	13-14	Hong Kong	x		x	
34	Koopman et al. (2014)	Deep cognitive learning strategies	Not reported	12-18	The Netherlands		x		Critical thinking
35	Lai and Biggs (1994)	Deep approach to learning	Science	12-14	Hong Kong	x			
36	Lau et al. (2008)	Deep learning strategies	Math	14-15	Singapore	x	x		
37	Lee et al. (2008)	Deep approaches to learning	Science	15-18	Taiwan	x	x	x	
38	Li et al. (2018)	Deep approach to learning	Science	13-16	China	x			
39	Liem et al. (2012)	Deep learning	Not reported	13-14	Australia	x			
40	Lingvay et al. (2015)	Deep approach to learning	Science	11-18	Hungary and Romania	x			
41	Luby (2014)	Deep approach to learning	Religion	13-16	Scotland		x		
42	Matos et al. (2017)	Deep-level learning strategies	Math	14-15	Peru		x		Metacognitive strategies, Critical thinking
43	Mazlum et al. (2015)	Deep learning approaches	Languages	16-17	Iran	x	x		
44	McClintic-Gilbert et al. (2013)	Deep learning strategies	Math, Science, Languages, Social science	11-14	USA		x		Metacognitive strategies, Critical thinking
45	McInerney et al. (2012)	Deep learning strategies	Languages, Math	12-14	Hong Kong	x	x	x	
46	Munowenyu (2007)	Deep level learning	Science	13-14	Zimbabwe	x			
47	Murayama et al. (2013)	Deep learning strategies	Math	10-16	Germany		x		
48	Norris et al. (2015)	Deep approach to learning	Social science	13-14	England		x	x	
49	Phan and Ngu (2015)	Deep approach to learning	Languages	15-16	Fiji	x	x	x	
50	Rao et al. (2007)	Deep approach to learning	Languages	11-12	Singapore	x	x		
51	Rozendaal et al. (2001)	Deep-level processing	Vocational	12-18	The Netherlands		x	x	Metacognitive strategies, Critical thinking

52	Şen (2016)	Deep cognitive learning strategies	Not reported	16-17	Turkey		x		Critical thinking, Long-term retention, Application of knowledge
53	Smith and Colby (2007)	Deep approach to learning	Not reported	Not reported	USA	x			
54	van Aalst et al. (2007)	Deep learning	Computer Science	16-19	Hong Kong	x	x	x	
55	Vos et al. (2011)	Deep learning	Languages	10-12	The Netherlands	x	x		Critical thinking, Long-term retention, Application of knowledge
56	Watkins and Ismail (1994)	Deep approach	Not reported	14-15	Malaysia/Hong Kong/Australia	x	x	x	
57	Watkins et al. (2003)	Deep learning approach	Not reported	14-15	South Africa	x	x	x	
58	Wishart and Triggs (2010)	Deep learning	Science, Computer Science	11-23	Germany, Lithuania, Portugal, Austria, UK	x	x		
59	Yerdelen-Damar and Elby (2016)	Deep level processing	Science	15-17	Turkey	x			
60	Yerdelen-Damar and Aydin (2015)	Deep level processing	Science	14-20	Turkey	x			Application of knowledge
61	Zhang and Ziegler (2016)	Deep-learning approach	Languages and Math	12-16	China	x			
62	Zheng et al. (2017)	Deep learning approach	Science	10-12	China	x	x	x	
63	Önen (2015)	Deep approach to learning	Not reported	14-17	Turkey	x	x	x	Application of knowledge

No	Author	Key term	Subject	Sample age range	Origin	Key elements in definition
64	Grover et al. (2015)	Deeper learning	Computer Science	11-14	USA	Transfer, Cognitive skills, Interpersonal skills, Intrapersonal skills
65	Nehring and Szczesiul (2015)	Deeper learning	Not reported	12-18	Northern Ireland	Transfer, Cognitive skills, Interpersonal skills, Intrapersonal skills
66	Parker et al. (2013)	Deeper learning	Social science	13-18	USA	Adaptive transfer, differentiated, elaborated, integrated and flexible
67	Parker et al. (2017)	Deeper learning/Deep learning	Social science	13-18	USA	Adaptive transfer, differentiated, elaborated, integrated and flexible
68	Parker et al. (2011)	Deeper learning/Deep learning	Social science	13-18	USA	Adaptive transfer, differentiated, elaborated, integrated and flexible

	Author	Key term	Subject	Sample age range	Origin	Connection to deep learning
69	Grotzer et al. (2015)	Transfer of learning	Science	10-12	USA	Deep initial learning is a requisite for transfer of learning
70	Pugh et al. (2014)	Transfer of learning	Science	14-16	USA	Deep learning, is a requisite for transfer of learning
71	Schiff and Vakil (2014)	Transfer of learning	Math	8-12	Israel	Deep initial learning is a requisite for transfer of learning

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Article 2

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ORIGINAL PAPER

Theoretical and practical, but rarely integrated: Norwegian primary school teachers' intentions and practices of teaching outside the classroom

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Abstract

This study investigates teachers' intentions and practices related to teaching outside the classroom. We report on three months of fieldwork consisting of participatory observations and qualitative interviews of teachers in two Norwegian primary schools practising weekly *uteskole* [outdoor school]. We find that the teachers' intentions for *uteskole* are to facilitate *first-hand experiences* for their pupils. The teachers organise and teach *uteskole* in two distinct ways: 1) *friluftsliv activities* [outdoor living activities] and 2) *theoretical learning activities*. The connections between *friluftsliv activities* and *theoretical learning activities* are seldom emphasised. Furthermore, the teachers rarely organise theoretical learning activities that entail pupils' transacting with their surroundings. We discuss how the teachers' work can be understood through the *Romantic* and the *Pragmatist* perspectives of experiential education and through the *representational epistemology* of traditional schooling. We outline how a *transactional epistemology*, operationalised as the "multi-modal model of knowing", can support teachers in facilitating *transaction* between the pupils and the environment outdoors and aid in establishing *continuity* between learning activities outdoors and indoors. We argue that these are important factors that can enhance *uteskole* as a teaching method for facilitating deep learning in Norwegian primary education.

Keywords Uteskole · Primary school · Teachers' intentions and practices · Epistemology · Friluftsliv

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Introduction

The aims of this study are to investigate Norwegian teachers' intentions for *uteskole* [outdoor school] and to explore how they practise this way of teaching.

According to Jordet (2010), *uteskole* is defined as regular classes held outside the school buildings on a weekly or bi-weekly basis in natural (e.g., forests and beaches) or cultural contexts (e.g., museums, theatres and farms) in order to enhance the pupils' understanding of a given subject. In Scandinavian countries, a grassroots movement of teachers have integrated *uteskole* into their teaching methods. The method has been described as initiating inquiry-based, problem-solving activities with explorative and practical approaches and is mainly practised in primary school (Barfod et al., 2016). The aspects of teaching and learning highlighted above are reflected in a central term in the current educational discourse: 'deep learning'. According to the Organisation for Economic Co-operation and Development (OECD) report "The Nature of Learning" (Dumont et al., 2010), the United States National Research Council report "Education for Life and Work" (Pellegrino & Hilton, 2012), and the recent curriculum reform in Norway (The Norwegian Directorate for Education & Training, 2020), deep learning entails that pupils seek to understand the meaning of the teaching materials, relate their ideas to their previous knowledge and experiences, and transfer and utilise their skills and knowledge in novel contexts. Dahl and Østern (2019) argue that all aspects of learning, i.e., embodied, social, emotional and cognitive, should be incorporated in teaching practices meant to facilitate deep learning. However, deep learning has mainly been investigated as a cognitive phenomenon (Winje & Løndal, 2020).

In Norway, the governmental authorities establish principles, values and competency aims for each subject in the school system, while the local municipalities and school leaders determine how they are achieved (Mølstad et al., 2020). The classroom setting is the most dominant context for teaching and use of environments outside has been limited to sporadic trips and excursions (Jordet, 2010). However, as Waite et al. (2016) describe, the Scandinavian countries have traditionally been associated with a strong cultural affiliation with nature, enjoying the outdoors and promoting cultural heritage and national identity, which can be summarised in the term *friluftsliv*. Lyngstad and Sæther (2020) highlight that outdoor recreation, outdoor life, free-air-life and adventure are concepts that can all be related to *friluftsliv*. *Friluftsliv* has been part of the Norwegian curriculum for over 40 years, and in their systematic literature review of *friluftsliv* in Norwegian primary and secondary education, Abelsen and Leirhaug (2017) found that seven of the twenty-four included studies were related to *uteskole*, indicating that *friluftsliv* is a central theme in the practice of *uteskole*. In Norway, the choice of teaching method is the responsibility of the teachers who traditionally have autonomy in their choice of methods. The pedagogical ideas and didactic methods of *uteskole* are incorporated in some courses of teacher education, often as part of specialisations in physical education or science, but there are no certification requirements for practising *uteskole* in Norway.

International reviews of outdoor learning programmes have found that regular compulsory school- and curriculum-based programmes can promote pupils'

development in social, academic, physical and psychological dimensions (Becker et al., 2017; Rickinson et al., 2004). According to Guardino et al. (2019), classes held outdoors provide a more authentic and engaging environment as well as opportunities to integrate content area subjects within outdoor experiences. Knowledge and practices related to *uteskole*, recently furthered by the Danish TEACHOUT project, document an increase in pupils' physical activity (Schneller et al., 2017), school motivation (Bølling et al., 2019) and enhancement of academic skills (Otte et al., 2019). Studies report that integrating outdoor learning programmes may be challenging due to lack of support from the school administration and colleagues, limited resources, limited time, and risk management (Bentsen et al., 2010; Rickinson et al., 2004). Barfod (2018) highlights that most research on *uteskole* has focused on pupils' learning outcomes, whereas few studies have investigated teachers' lived experiences of teaching outside the classroom. The lack of research indicates a need for studies investigating teachers' experiences with teaching outside the classroom. The aim of this study is to investigate teachers' intentions and practices related to *uteskole*, guided by the following research questions:

- What are teachers' intentions in practising regular *uteskole*?
- What activities and strategies do teachers utilise when practising *uteskole*?

When approaching this study, our expectations, primarily based on our own experience practising *uteskole* and working in teacher education, were that the teachers would emphasise teaching *friluftsliv* in *uteskole* to make their pupils enjoy being outdoors. Several theoretical perspectives might contribute to the understanding of teachers' work with *uteskole*.

Theoretical perspective

Uteskole is part of the field of *experiential education,* encompassing a variety of curriculum projects from outdoor and environmental education to service learning and place-based education, drawing from the same progressive intellectual taproot, the belief in the educational power of experience. Roberts (2012) elaborates on the theoretical perspectives of experiential education and identifies four "currents": Romantic, Pragmatist, Critical Theory and Market Rationality. This analysis have been used in research on outdoor education, for example, by Mannion and Lynch (2016) focusing on "place" in education, and Warner et al. (2020) regarding the emergence of neoliberal ideologies in outdoor adventure education. However, we have not been able to identify any research applying Roberts' analysis to *uteskole*, and we believe that this could be a useful framework to guide our understanding of *uteskole* teachers' intentions and practice. We decided to focus on the Romantic and the Pragmatist perspectives because they purport different viewpoints on knowledge and learning.

According to Roberts (2012), a Romantic perspective entails that the central aim of education is 'to provide opportunities to learn from experience before learning

from labels' (p. 39). Labels or representations are mediated by society, while experiences emerge from the unmediated contact between the individual and the environment. The philosophical foundations for this perspective can be found in Rousseau's notions of an ideal educational process focusing on the free and natural development of the individual, avoiding the corrupting influences of society. As Rorty (1998, p. 248) explains, 'He is to learn from experience, by the consequences of his actions rather that from persons or books'. Roberts (2012) argue that teaching practices based on a Romantic perspective of experience and learning represent a significant limitation in curriculum-based education. The Romantic perspective also extends to the understanding of *friluftsliv* in Nordic educational research. Goga et al. (2018, p. 12) characterise one of the main elements in their Nature in Culture Matrix as the *celebratory position*, which 'implies the idea of the "pure child" or "child in nature" as a key figure in the cultural and pedagogical position.

According to Roberts (2012), the central aim of education, seen from a Pragmatist perspective, is to facilitate curriculum projects, with knowledge being shared and used to solve problems in authentic situations. The Pragmatist perspective highlights a conscious connection between the school and the community. The notions of experience and education of Pragmatist philosopher John Dewey are often described as fundamental to experiential education (Ord & Leather, 2011; Quay & Seaman, 2013), especially his critique of the dichotomy between 'the school world' and 'the real world", the dialectic relationship between "action" and "reflection", and the importance of context in acquisition of skills and knowledge.

Dewey (1963) underlines two criteria for educational experiences, *continuity* and *interaction*. *Continuity* means that every new experience incorporates elements from previous experiences and modifies the quality of later experiences. A consequence of the principle of continuity is that education should be defined as 'the reconstruction or reorganisation of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience' (Dewey, 1916, p. 16). *Interaction* refers to the interchange that occurs between the internal conditions of the subject and the objective conditions of the environment; these two aspects form a situation. Accordingly, the duty of the educator is to 'determine that environment which will interact with the existing capacities and needs of those taught to create a worth-while experience' (Dewey, 1963, p. 45). In later writings, Dewey preferred the term 'transaction' rather than 'interaction' because transaction emphasises the process, while interaction suggests the existence of independent entities that interact (Dewey & Bentley, 1949). We agree with Deweys' nuancing of the term and, similar to Biesta and Burbules (2003), use "transaction" as the preferred term in this article.

Several scholars within the field of experiential education argue that Dewey's theories have been misunderstood or simplified. Roberts (2012) describes how the catchphrase "learning by doing" seems to be equated with a method. Quay and Seaman (2013) and Ord and Leather (2011) both argue that Deweys' theories have become overly simplified within the field of outdoor education, and there has been little emphasis on the dialectic relationship between "action" and "reflection". Although Dewey's theories are purported as fundamental to experiential education, it seems researchers and practitioners in the field struggle with how his theories can

be implemented in practice. Nicol (2003) suggests that Western philosophy's focus on dualistic thinking and the epistemological understanding of knowledge as a second-order expression of reality might affect outdoor educators' practice.

Representational epistemology

Biesta and Burbules (2003, p. 9) describe the traditional understanding of epistemology as "the branch of philosophy that tries to give an answer to how our mind can acquire knowledge of a world outside our mind". Until the late nineteenth century, new generations mainly learned through participation in everyday work, but as Osberg et al. (2008) pinpoint, when traditional schooling was established, school became a separate educational world for children needing to represent "real life" within the confines of school, and this is achieved through the use of "representations", a second-order expression of reality. Biesta and Burbules (2003) refer to this understanding of knowledge as a *representational epistemology*; what is presented in education stands for something else that is 'out there'. They suggest that a representational epistemology might be understood as an original and inevitable distinction that is given for all philosophies and found in the dualistic distinctions between mind and matter, subject and object, and mental and physical. For Dewey (1925), there is no dualistic point of entry; the only way we can understand these processes is through our activities – the "doings" – and experiencing their consequences. Nicol (2003) argues that sometimes it is appropriate that knowledge is represented in this way; however, it becomes a problem if it is monopolised, resulting in society favouring one form of knowing over others. He claims that the representational epistemology is a historically inherited epistemological position that has become a deeply embedded cultural construct acting as an invisible mediator of knowledge that affects and shapes current teaching practices.

According to Biesta and Burbules (2003), Dewey argues that the dualistic perspective, which representational epistemology is founded upon, is flawed because it tends to centre on the mind and cognitive aspects rather than the interactions between the human organism and its environment. Dewey (1925) rejected the Cartesian mind–body dualism and instead claimed that 'higher' cognitive operations occur against the background of a complex interplay between the individual and the environment, suggesting that there is no division between the act and material of the subject; rather, both are contained in an unanalysed totality.

Transactional approach and transactional epistemology

To overcome what he describes as a false division between the human organism and the environment, Dewey (1925) proposes the use of the *empirical method*. When we encounter a problem, what he calls a primary experience, we can perform symbolic actions – an activity he calls 'thinking' where we try different lines of action without being subjected to the consequences. However, it is only when we act that we can know if our action was appropriate. Thus, the result of 'thinking' is a secondary experience that needs to be tested against the problem first encountered. Dewey

calls this the *transactional approach* in a later work (Dewey & Bentley, 1949). He argued that experiences are always intertwined and that making distinctions between primary and secondary experiences should be regarded as a tool for analytical purposes. Ord and Leather (2011, p. 15) find it useful to look at experiential learning from a three-dimensional stance, "as a continuing spiral of action designed to build upon each other and so extend an individual's range of experience and cognition over time".

Building on Dewey's transactional approach, Biesta (2010) questions the representational epistemology and suggests an alternative perspective, a *transactional epistemology,* where we must concede that the knowledge we gain through experimentation is knowledge about the relationships between actions and consequences that may provide us with hypotheses for problem solving, although there will always be a gap between our knowledge and new situations. There is no guarantee that what was possible in the past will also happen in the future. Biesta argues that we must give up the idea that it is possible to achieve complete knowledge about reality because the world always appears to us through our actions, and subsequently, the world always changes as a result of our actions: we are participants in an ever-evolving universe. As Ord and Leather (2011) pinpoint, the notion of "change" is as a reconceptualisation of how we see the world as much as an actual physical change in it. Thus, when we experience, we are changed, but so is the world, both how we perceive and conceive it as changed.

Epistemology in outdoor education and uteskole

Dewey's transactional approach, comprising a positive circular process of primary and secondary experiences processed through 'thinking', is integrated in the didactic model of *uteskole* in the works of Jordet (2010). The *uteskole* context provides opportunities for pupils to have primary experiences outside school, while the classroom is a suitable context for performing symbolic actions. *Uteskole* is suitable for testing these different lines of action outside the classroom, and pupils can be subjected to the reality of consequences that may be reflected and elaborated in a continuous positive circular process.

The representational epistemology and the transactional epistemology seem to coexist in the field of experiential education, and Nicol (2003) highlights the need for outdoor educators to be familiar with different epistemological positions and adopt an epistemological strategy that is appropriate for the learning outcomes they are trying to achieve.

Materials and methods

In the present study of teachers' intentions and practices, we chose to conduct a multiple case study (Yin, 2008) in two primary schools with regular *uteskole* in Norway. Since we aimed to explore teachers' intentions and practice, we wanted to study the subjects in real-life situations and adopted a qualitative life-world approach

(Bengtsson, 2006). Data collection included participatory observations over a period of three months followed by qualitative research interviews with the teachers.

Sample

The prevalence of *uteskole* in Norway has not recently been mapped, and we used *snowball sampling* (Cohen & Arieli, 2011), utilising our network of teachers, principals and educational researchers to identify relevant schools. The main inclusion criterion was that the schools themselves highlighted and promoted *uteskole* as a weekly feature. Two schools were selected, both located in the eastern part of Norway. School 1 (S1) is a primary school with 400 pupils between 6 and 13 years of age with lower socio-economic background situated in a suburban neighbourhood near a forest. Each grade has two classes, each consisting of 20–25 pupils. Only first and second grades have *uteskole* weekly in this school, and we decided to include the pupils in the second grade and the two teachers who always participated in *uteskole*. School 2 (S2) is a primary and lower secondary school with 600 pupils between 6 and 16 years of age from higher socio-economic backgrounds, situated in a suburban area. Each grade has two classes consisting of approximately 25 pupils. Fifth to seventh grades have *uteskole* weekly, and the three teachers who always participated in *uteskole* were included. The teachers are given aliases that accurately represent their genders, and their school affiliation is denoted by adding S1 or S2 after their names. Three of the teachers, Annie (S1), Lawrence (S2) and Otto (S2), had been practising *uteskole* for many years, while two of the teachers, George (S1) and Charlie (S2), had been practising it for only a few years.

Data collection

The fieldwork was completed in the autumn of 2018 with participatory observations for a total of 15 days. As recommended by Brinkmann and Kvale (2015), the structure and themes of the observation guide were refined through preliminary visits during a *uteskole* day at each of the two schools. At S1, the teachers were observed for six whole days that included a combination of outdoor and classroom activities. At S2, the teachers were observed for six whole outdoor days and three short days with classroom activities related to the *uteskole* because, in contrast to S1, these activities are not carried out the same day as the outdoor days. Notes on activities were recorded continuously without predetermined activity categories. In line with Merriam (2009), the group was followed during their regular routines, and field notes were taken of the teacher's activities and locations. Information was collected from teachers through walk-along interviews and conversations, and the field notes were rewritten into complete text files within two days. After the observation period, a comfortable setting (staff room, at home) were used for individual interviews of the five teachers. As suggested by Brinkmann and Kvale (2015), a semi-structured interview guide with open-ended and explorative questions was tested through a pilot interview with a colleague who had extensive experience with *uteskole*, leading to a

revision of questions with overlapping themes. The interviews were audio-recorded and lasted between 45 and 120 min.

Transcription and analysis

The first author prepared the field notes, and a professional transcriber wrote the interviews verbatim. The interview transcripts were checked against the audio files by the first author to ensure that the meanings had been captured (Brinkmann & Kvale, 2015).

The analyses were inspired by the *six-step model of thematic analyses* of Braun et al. (2016). In the first phase, the material from the observations and the interviews were read several times with increasing thoroughness to obtain an overview. In the second phase, codes were developed to clarify and structure the material. In phases 3 to 5, codes were further developed, improved and named. In the sixth and final phase, the findings were structured and written into the research report. This six-step model for analysis should be considered a dynamic process that is continually shaped by the researcher's active choices (Braun et al., 2016).

In line with Braun and Clarke (2006), the inductive interpretation of the identified themes was strongly linked to the data, while the theoretical interpretation was supported by relevant theory. As suggested by Braun et al. (2016), inductive interpretations were performed first, and theoretical interpretation was conducted later with the use of theory to highlight and support the inductive interpretations.

Trustworthiness

As described by Merriam (2009), we provided thorough descriptions of all steps in the research process, referred to the field notes and interview transcriptions during presentation of the results, and related them to theories, methods, and concepts used in previous studies on *uteskole*, outdoor learning and experiential education. As suggested by Johnson (1997), both authors initiated and planned for the study, the first author conducted the fieldwork and the interviews, and both authors collaborated discussing the data collection and participated actively in the analyses, also focusing on discovery and inclusion of situations and interpretations that did not conform to our expectations, as described in the introduction section.

Ethical considerations

The teachers, pupils and pupils' guardians were given oral and written information about the project, the possible consequences of participating and their ability to withdraw at any time before they gave written consent upon participation (Brinkmann & Kvale, 2015). As suggested by Backe-Hansen and Frønes (2012), when following particular pupils during observation, the first author always asked them for permission before doing so. To secure confidentiality, all informants were given aliases, no characteristics regarding the participants' appearance or ethnic background were recorded, and the schools' names are not reported. The Norwegian Centre for

Research Data approved the steps taken in this project to protect the participants' privacy (Project Number 60432). All extracts from interviews are reproduced in the author's translation, as loyal to the spoken language as possible; however, the participants were not given the opportunity to member check their data after the translation.

Results

When presenting the results on the teachers' intentions and practices related to *uteskole*, we refer to situations that represent the totality of the material. Information on the teachers' intentions is mainly found in the interview data, whereas information on the teachers' practices, activities and strategies regarding *uteskole* is mainly found in the observation and interview data. The two data sets reveal three main themes related to the research questions:

First-hand experiences (1) comprise teachers' intentions to use *uteskole* to provide the pupils with experiences of what they call 'real life', to help the pupils process these experiences, and the barriers they face when trying to do so. *Friluftsliv activities* (2) and *theoretical learning activities* (3) describe the two main strategies used in practising *uteskole*.

First-hand experiences

The teachers in both schools describe that their main intention for *uteskole* is to provide opportunities to gain first-hand experiences in what the teachers call 'real life'. As Annie (S1) explains,

> I believe that the most important part is the relation to real-life and first-hand experiences. It is not just something they are going to sit and read about; they can touch things, smell them and get a feel for them.

The teachers emphasise that leaving the classroom and bringing the pupils into 'real life" outside enhances their learning because it connects school and curriculum to authentic environments. They also highlight the pupils' opportunities to use all their senses in *uteskole*, to strengthen experiences stimulating long-term memory.

Although the teachers express similar intentions regarding first-hand experiences, they express different views regarding processing of experiences in *uteskole*. George and Annie (S1) emphasise the importance of a close connection between learning activities in the classroom and in *uteskole*. As George (S1) describes,

> You can sit in a classroom and learn about birds by watching movies or drawing. However, the idea is to do it inside first and then go out and watch and listen to the birds. Unfortunately, they cannot touch the bird, but they are not far from it; they are studying it. Then, we return to the classroom, and they can capture their experience on a piece of paper. In this way, they enhance their learning.

George and Annie envision a positive circular learning process between *uteskole* and the classroom by working with the material theoretically in the classroom and more experientially in *uteskole*. The teachers in S2 focus on providing opportunities for the pupils to experience nature and to be physically active. Otto, Lawrence and Charlie (S2) describe an indirect processing of first-hand experiences where the first-hand experiences from *uteskole* are understood as something that the teacher *might* highlight or draw parallels to at a different time.

Barriers regarding the processing of first-hand experiences

Although teachers from both schools highlight the potential of processing first-hand experiences, they also describe certain obstacles. Annie and George (S1) mention their frustration with lack of time resources for planning and for teacher collaboration when practising *uteskole*. The teachers in S2 also express challenges with facilitating processing first-hand experiences, as Lawrence explains: 'No, we are not that structured. The fact that we have three different age groups makes it difficult to connect to the classroom activities". When pupils from three grade levels attend at the same time, it is too burdensome to cooperate with other teachers with different subjects in their respective classes. The teachers in S2 acknowledge that facilitating a structured processing of first-hand experiences might also enhance the pupils' learning of curriculum content, but they do not schedule or organise a collective reflection.

Although the teachers express somewhat different intentions and encountering different challenges in their *uteskole* practices, they utilise the same two main activities of *friluftsliv* and *theoretical learning*.

Teachers' practices – Friluftsliv activities [outdoor living activities]

All our informants highlight that *uteskole* provides possibilities for teaching skills relevant to being outdoors and participating in Norwegian culture. A typical description is given by Annie (S1):

> *Uteskole* is the main arena for teaching *friluftsliv*. When we think about skiing, skating, hiking and bonfires, it is not something every Norwegian does regularly, but it is an important part of our culture that can be passed on to all the kids with a completely different culture in a natural way, which they do not necessarily encounter elsewhere.

In addition to explaining *uteskole* as a way to teach about appropriate outdoor clothing and general outdoor skills, the teachers describe *uteskole* as a natural way of teaching *friluftsliv* to pupils with a different cultural background, making them more prone to seek similar experiences in the future.

The teachers all emphasise the positive aspects of *friluftsliv* activities in *uteskole*, but some teachers also note that they are not always able to carry out the intended *theoretical learning activities* because it takes longer than anticipated to travel to the *uteskole* location.

Teachers' strategies – Theoretical learning activities

While the previous two themes present findings derived mainly through inductive analysis, the findings in this theme were established mainly through thematic and theory-driven analysis. We identified two underlying strategies regarding the facilitation of theoretical learning activities: *manipulation of symbols* (1) and *the connection between theoretical and practical learning activities* (2).

Manipulation of symbols

The pupils' ability to manipulate and represent symbols plays a significant part in both schools' *uteskole* activities, and the products are mainly symbolic representations, i.e., words, calculations or drawings, exemplified by an observation from S2:

> Charlie takes 20 pupils away from the main group at the campsite to an open area. He lets the pupils choose who they want to pair up with and presents a piece of paper with four rebuses that reveal the names of four Norwegian inventions.

This observation note exemplifies the emphasis on representations and theoretical learning in the *uteskole* context, where the pupils need to combine drawings, numbers and letters.

Combining physical activity and repetition of theoretical knowledge is also a typical activity in both schools, as Annie (S1) describes:

> We use a task called 'The 50-game', where they (the pupils) solve fifty different repetition tasks related to content they have been taught in, for example, religion, math or science. They run around looking for task sheets that are spread over a limited area in the woods; they solve the tasks and return to us with the answers.

The teachers combine physical activity and the repetition of content that the pupils have worked on in the classroom before, often through quiz-like tasks. In *uteskole,* the pupils either have freedom of movement or are required to perform some sort of physical activity while solving these tasks.

The connection between theoretical and practical learning activities

The teachers organise learning activities aiming to integrate and apply knowledge attained in the classroom to authentic situations outdoors. The following observation notes from S2 provide an example:

> The pupils are divided into groups of two to four and given a map which they shall use to find their way to a forest located some distance from the school. Otto, Lawrence and Charlie follow at some distance, either by foot or by bike. If one of the groups diverges from the route laid out on the map, the teachers' guide them in the right direction. Since the teachers walk behind the pupils

during the activity, there is little probability of any of the groups not finding the *uteskole* location; however, one group still manages to get lost, and the teacher has to guide the pupils to the correct location. The pupils stop at designated spots on the map to solve math tasks. A typical task is as follows: 'At this address, there is a house. Count the number of windows, divide by the number of outdoor lights, and add the number of garages. What is the answer?'

The task consists of several steps: the pupils must 1) find the correct address, 2) gather information about elements of the house or garden, and then finally 3) perform calculations and write the answers on a piece of paper. At the end of the *uteskole* day, the teachers evaluate the pupils' efforts by checking their answers. However, the practical use of the map is not emphasised by the teachers other than an expression of slight frustration regarding the one group becoming lost.

Another example of an activity aimed to establish connection between theory and practice is observed in S1. Before going out, the teacher explains how to build a bonfire and how to behave safely, but when it is time to build the bonfire, the pupils are given a totally unrelated task to create land-art that must contain either letters or numbers. The practical steps of finding firewood and building, lighting and putting out the bonfire are performed by the teacher without any of the pupils participating. When they return to the classroom, the pupils are tasked with processing their experiences in *uteskole* by reading, writing and colouring a template about bonfires. These learning activities are mainly theoretical: 1) learn the rules and principles of bonfires in the classroom before going out, 2) use symbols to create land art at the *uteskole location*, and 3) read the principles of bonfires and colour a template of children sitting around a bonfire when back in the classroom.

We find that the teachers intend to use *uteskole* to facilitate situations where the pupils can experience "real life" and that, ideally, these experiences are processed through reflection, conversation, writing and drawing. However, the teachers find it challenging to facilitate this processing due to limited time in planning and coordinating with the other teachers and the tight scheduling of school days. The teachers intend to focus on both *friluftsliv* activities and theoretical learning activities in *uteskole*, but they are not integrated with each other.

Discussion

Our research questions – *What are teachers' intentions in practising regular uteskole, and what activities and strategies do teachers utilise when practising uteskole?* – present the following issues for discussion.

Romantic and Pragmatist intentions

The teachers from both schools' express intentions in their *uteskole* practice and organise activities, reflecting elements of both the Romantic and Pragmatist currents in the field of experiential education despite their quite different positions regarding education.

Romantic

The teachers emphasise facilitating situations in *uteskole* where the pupils can experience nature first-hand, particularly *friluftsliv* activities, such as walking, hiking, skiing or bicycling to the *uteskole* location, different camp activities involving bonfires, the use of saws, axes and knives, and playing in nature. The teachers describe these activities as educative and argue that they are important because *friluftsliv* is a central part of both the physical education (PE) curriculum and Norwegian culture. This is in line with Lyngstad and Sæther (2020, p. 11) claim that the pupils do not only learn to master skills related to *friluftsliv* but also about themselves as "subjects in nature". The teachers' statements that these *friluftsliv* activities are educative in themselves and the lack of emphasis on establishing a connection between these activities and learning activities in the classroom or theoretical knowledge might be interpreted as expressions of a Romantic perspective. This Romantic notion of *friluftsliv* is also described in Nordic educational research, for example, by Goga et al. (2018) calling it the "celebratory position", and similar accentuation of *friluftsliv* can be found in the new Norwegian curriculum (The Norwegian Directorate for Education & Training, 2020).

Roberts (2012) underlines that from a Romantic perspective, the idea of the transformative potential in direct experiences can be disrupted by too much structure and discipline. The importance of avoiding the corrupting influences of society purports an educational practice where the individual stands alone, destined to make sense of experiences solely through their own previous experience, an individualisation of the educational process. Dewey (1963, p. 25) warned "the belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative. Experience and education cannot be directly equated to each other". Even though the pupils' first-hand experiences in *uteskole* may be powerful and lead to formative changes, the individual emphasis on the Romantic current makes it difficult to incorporate it into curriculum programmes. Furthermore, the disregard of society and its "corruptive influence" on pupils' does not blend well with the idea of education as a tool for developing future democratic citizens. Our findings indicate that one might miss opportunities to actualise the pupils' experiences into useful educative processes when relying on the idea that the experiences are formative enough in themselves.

Pragmatist

The teachers in this study also express intentions and practices in line with a Pragmatist position. The teachers from S1 explicitly adhere to the didactic model of *uteskole* (Jordet, 2010) by intending to establish a connection between learning activities in the classroom and learning activities in *uteskole* through a positive circular learning process. This could fulfil one of Dewey (1963) criteria for educative experience, as an example of continuity. However, the main emphasis of the teachers in S1 seems to be on documenting the pupil's experiences by representing it afterwards, in the classroom. This seems to be based on an understanding influenced by traditional ideas of schooling and a representational epistemology. This

interpretation of the teachers understanding is further strengthened when we look at the learning activities that are organised outdoors. In addition to the *friluftsliv* activities, the teachers organise *theoretical learning activities*, which involve the repetition of previously taught curriculum content, letters, numbers, and calculus. This highlights a paradox: representational knowledge, which is used to represent the world outside the classroom, is brought outside, into the context that it is meant to represent. Instead of facilitating activities through which the pupils are able to utilise and test their knowledge in authentic situations, what (Dewey, 1963) would call transactions, they are given representational learning tasks identical to those given in the classroom. This is a potent example of how a representational epistemology permeates teachers' practices and becomes the main focus of *uteskole*. The incorporation of physical activity, e.g., the "50 s game" of running combined with solving quiz-questions seems to be an attempt by the teachers to establish a transaction between the pupils and the environment, but without connection between the physical activity and the theoretical learning activity. The *Active Smarter Kids* (ASK) project (Resaland et al., 2016) examined a suggested connection between physical activity and academic achievement but could not document significant associations. The emphasis on documentation and representational knowledge and the lack of focus on facilitating transactions between the pupils and their surroundings result in a distortion of the didactic model of *uteskole* and lead to practices that cannot be considered in line with Dewey (1963) notions of experience and learning. As Murphy (2020, p. 1) highlights, teachers teaching outside the classroom should set up an environment that invites and sustains active investigation and that "the outdoor learning environment should not mirror the indoor classroom or the school yard at break time".

Epistemology and structure

According to Ord and Leather (2011), similar simplifications or misunderstandings of Dewey's theories are common in the field of outdoor education. They argue that "reflection after action" simply is not enough because an experience and the resulting learning is established as a continuous transaction. The teachers bring the representations and indoor learning activities outdoors in an attempt to establish continuity. Unfortunately, this creates a disruptive effect; the focus is moved away from pupils transacting with their surroundings to pupils transacting with representations, which are seldom related to the context, e.g., a rebus with Norwegian inventors.

The teachers express several barriers that limit their efforts and fuel frustrations, such as lack of time resources, coordination and support, as reported in studies of *uteskole* (Bentsen et al., 2010) and studies of outdoor education (Rickinson et al., 2004). Nicol (2003) argues that educational institutions have become preoccupied with separating and compartmentalising knowledge. The rigid emphasis on timetabling, 45-min classes, 15-min breaks, and strict differentiations of school subjects results in schools mirroring the organisation of production lines, which might make it difficult to facilitate learning situations where the pupils can experience how school subjects are interconnected and related to anything beyond the classroom.

Although the Pragmatist foundation of *uteskole* is reported as important by the teachers, the struggle in *uteskole* seems to be both epistemological and structural.

"Multi-modal model of knowing" as an operationalisation of a transactional epistemology

One way of helping teachers liberate themselves from the grip of representational epistemology might be as Nicol (2003) outlines in the concept of a "multi-modal model of knowing", providing an alternative framework of epistemological diversity. He distinguishes between *experiential*, *presentational*, *propositional* and *practical* ways of knowing. *Experiential knowing* is knowing through the direct first-hand experience of a person, place or thing. *Presentational knowing* is manifest in images that articulate experiential knowing, for example: arts, 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. *Practical knowing* involves how to do something, expressed as a skill, knack or competence. This "multi-modal model of knowing" may be an important guide to operationalise a transactional epistemology into the practice of *uteskole*.

In Norway, the recent curriculum reform highlights *deep learning*, which entails ensuring that pupils seek to understand the meaning of the teaching materials, relate their ideas to their previous knowledge and experiences, and transfer and utilise their skills and knowledge in a novel context (The Norwegian Directorate for Education & Training, 2020). We argue that *uteskole* is a teaching method that may support teachers in facilitating deep learning.

There is a need for increased focus on the integration of both theoretical and practical learning activities in *uteskole*. The teachers should adopt an epistemological position that entails a holistic understanding of knowing, in which all aspects of learning are incorporated in the teaching practices and such an integration presupposes a transactional epistemology as the foundation. This is an epistemological position that is congruent with the philosophical foundations of *uteskole* and Deweys' perspective on experience, learning and education. A *transactional epistemology*, operationalised through a "multi-modal model of knowing", can provide support to teachers in order to facilitate *transaction* between the pupils and the environment outdoors, ultimately aiding them in establishing *continuity* between learning activities outdoors and indoors.

Concluding remarks

The teachers' serious intentions to facilitate first-hand experiences of the environment outside the classroom to enhance their pupils' learning encounter difficulties in linking experiences in *uteskole* with the curriculum content. The teachers' frustrations are related to the lack of all types of resources, but the multiple epistemologies that are embedded in and influence their practices seem to be the main obstacles to taking advantage of the possibilities in the didactic model of *uteskole*. Furthermore,

we find that the Romantic and Pragmatist currents, which entail very different notions of how learning should be facilitated, are both present in the teachers' intentions and practice of *uteskole*. The emphasis on the transformative power of direct experience in the Romantic current is mainly reflected in the teachers focus on *friluftsliv*, while the Pragmatist emphasis on processing experiences is reflected in the focus on documenting the first-hand experiences and the attempts to facilitate continuity and transaction through theoretical learning activities outdoors. For *uteskole* to more consistently contribute to Norwegian schools' commitment to deep learning, teacher training programmes should focus on learning about the different epistemological positions and how these positions might influence the practice of *uteskole*. There is a need for further studies of teachers' intentions and practices related to *uteskole* that critically apply its foundational philosophical framework.

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Article 3

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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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outdoor education; deep learning; pupils' experiences; primary education; uteskole

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 firsthand 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, Harring, 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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