



The outdoor environment in children's learning

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Dissertation submitted in partial fulfilment of a Ph.D.-degree



UNIVERSITY OF ICELAND
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Abstract

The outdoor environment in children's learning

This doctoral thesis contributes to discussions about the role of the outdoor environment in children's learning. The intention of this research was to investigate the role of the outdoor environment on policy makers', teachers' and children's views, as well as teachers' actions regarding children's learning. To accomplish this, four studies were conducted, each focusing on one of the agents' views and the teachers' use of the outdoors. Study 1 was about what characterises the discourse on the role of the outdoor environment in children's learning in policy documents, both countrywide and on a municipal level. Study 2 was about how teachers, who were experienced, using an outdoor learning environment and had participated in a project on sustainability education, experienced and viewed the role of the outdoor environment in children's learning. Study 3 was about children's views and preferences of the outdoor environment. Study 4 was about how teachers used the outdoor environment in children's learning about living beings.

The theoretical background of the research constitutes of concepts drawn from various theories. These are Gibson's (1979) theory of affordance of the environment, Dewey's (1938/2000) theory of experience, place-based theories (see, for example, Gruenewald & Smith, 2008), socio-cultural theory (see, for example, Rogoff, 2003), and theories of children's participation (see, for example, Percy-Smith & Thomas, 2010).

Qualitative methods were used in the research, except a historical discourse analysis was employed for analysing policy documents. Data was gathered over a period of three years in 2008–2011. The data in Study 1 was gathered by selecting specific documents both country wide and also from municipalities in the eight main parts of Iceland, Data analysis was done by using historical discourse analysis (Jóhannesson, Jóhannesson, 2006, 2010). Studies 2–4 were parts of two bigger research and development projects. On one hand, the *ActionESD* project conducted by a research group from the School of Education at the University of Iceland and the University of Akureyri, and on the other hand a research and development project called *On the same path* in collaboration with the

Centre for Research in Early Childhood Education at the University of Iceland. The data in these studies were gathered by interviewing teachers and children and by observing classrooms practices and outdoor activities. Six steps thematic analysis described by Braun and Clarke (2006) was used to analyse the data.

The findings indicate that policy makers, teachers, and children all see the outdoor environment as having a high status and as a beneficial learning environment that provides multiple opportunities for learning and development. Four major themes about the role of the outdoors could be identified across the four studies. The outdoor environment was seen and used as a place: (a) to further children's play and learning; (b) to promote children's physical and mental well-being; (c) for children's risk-taking and safety; and (d) to form children's views and attitudes towards the environment. There were several surprises and gaps in the findings. The most important surprise was the silence about the outdoor environment as a school-learning environment in the legislative documents, in comparison to its emphasis in curricula and local documents. Another surprise was the emphasis in municipalities' policy documents on local pride. This emphasis was the only reference to children's democratic participation related to the outdoors in the policy documents. The legislative materials and the curricula, did not emphasise this issue. The teachers on the contrary saw various opportunities in using the outdoors to foster children's participation in society. There were also gaps in the findings. In particular, little or no connections could be noticed between the outdoor environment and gender or between children's diverse backgrounds or multiple abilities and their respective uses of the outdoor environment. This indicates that the discussion regarding the outdoor environment is rather new and does not involve all aspects important to address when discussing children's learning.

Ágrip

Útiumhverfið í námi barna

Doktorsritgerðin er framlag til fræða um hlutverk útiumhverfis í námi barna. Ætlunin var að rannsaka hugmyndir stefnumótenda, kennara og barna um hlutverk útiumhverfis í námi barna auk notkunar kennara á útiumhverfinu. Gerðar voru fjórar hlutarannsóknir til að rannsaka sjónarhorn þessara hópa og notkun kennara á útiumhverfinu. Í fyrstu hlutarannsókninni var athugað hvað einkenndi orðræðu um hlutverk útiumhverfis í námi barna í stefnuskjölum yfirvalda, bæði á landsvísu og í einstökum sveitarfélögum. Í annarri hlutarannsókninni voru hugmyndir kennara um hlutverk útiumhverfis athugaðar en um var að ræða kennara sem höfðu reynslu af því að nota útiumhverfið í námi barna og voru þátttakendur í rannsóknar- og þróunarverkefni um sjálfbærnimenntun. Í þriðju hlutarannsókninni voru hugmyndir barna og óskir um hvað þau vildu gera á skólalóðinni eða leikvöllinum athugaðar. Í fjórðu hlutarannsókninni var athugað hvernig kennarar notuðu útiumhverfið í námi barna um lífverur.

Kenningalegur bakgrunnur rannsóknarinnar byggir á hugtökum sem dregin eru úr ýmsum kenningum. Þetta eru kenning Gibsons (1979) um hvernig sjá má möguleikana (e. affordance) sem umhverfið býður upp á, kenning Deweys (1938/2000) um reynsluna (e. experience), kenningar um staðarbundið nám (e. place-based) (sjá til dæmis Gruenewald og Smith, 2008), félagsmenningarlegar kenningar (e. socio-cultural) (sjá til dæmis Rogoff, 2003) og kenningar um þátttöku barna (e. participation) (sjá til dæmis Percy-Smith og Thomas, 2010).

Eigindlegar aðferðir voru notaðar í rannsókninni með þeirri undantekningu að orðræðugreining var notuð við greiningu stefnuskjala. Gagna var aflað á árunum 2008–2011. Gagna í fyrstu hlutarannsókninni var aflað með vali á ákveðnum stefnuskjölum til greiningar, bæði á landsvísu og frá sveitarfélögum úr öllum landshlutum hér á landi (miðað við kjördæmaskipan frá 1959). Þau voru greind með sögulegri orðræðugreiningu (Jóhannesson, 2006, 2010). Gagna í hinum þremur hlutarannsóknunum var aflað í tveimur stærri rannsóknarverkefnum. Annars vegar var það rannsóknar- og þróunarverkefnið *Geta til sjálfbærni – menntun til aðgerða* sem unnið var að í samstarfi við rannsóknarhóp á Menntavísindasviði Háskóla Íslands og Háskólanum á Akureyri. Hins vegar

var um að ræða rannsóknar- og þróunarverkefnið *Á sömu leið* sem unnið var að í samstarfi við Rannsóknarstofu í menntunarfræðum ungra barna. Gagna var aflað með viðtölum við kennara og börn og með vettvangsathugunum í skólum og á útsvæðum. Gögnin voru greind samkvæmt sex þrepa þemagreiningu sem Braun og Clarke (2006) hafa lýst.

Niðurstöðurnar benda til að stefnumótendur, kennarar og börn meti útiumhverfið mikils sem námsumhverfi og telji að það bjóði upp á ýmsa möguleika fyrir nám og þroska. Fjögur meginþemu um hlutverk útiumhverfis í námi barna mátti sjá í öllum hlutarannsóknunum. Útiumhverfið var álitid og notað sem staður til að: (a) ýta undir leik og nám barna, (b) efla líkamlega og andlega vellíðan barna, (c) taka áhættur og finna fyrir öryggi og (d) hafa áhrif á viðhorf barna til umhverfisins. Sumar niðurstöðurnar komu á óvart og einnig kom ýmislegt ekki fram í rannsókninni sem hefði mátt búast við. Það sem kom aðallega á óvart var ákveðin þögn um útiumhverfi sem námsumhverfi skóla í lögum og reglugerðum, sérstaklega í samanburði við þá áherslu sem lögð er á útiumhverfi í námskrám og stefnuskjölum sveitarfélaga. Annað sem kom á óvart var áhersla sveitarfélaga á að ýta undir stolt íbúa af umhverfinu. Þessi áhersla í stefnuskjölum sveitarfélaga var eina merkið um lýðræðislega þátttöku í tengslum við útiumhverfið en í lögum, reglugerðum og námskrám kom ekki fram áhersla á þetta. Kennarar lögðu aftur á móti töluverða áherslu á að útiumhverfi væri mjög gott til að ýta undir þátttöku barna í samfélaginu. Niðurstöðurnar leiddu einnig í ljós ákveðnar eyður í umræðunni um hlutverk útiumhverfis. Þannig var umfjöllun um kyngervi, mismunandi bakgrunn barnanna svo og mismunandi getu þeirra lítið sem ekkert tengd við útiumhverfið. Þetta er vísbending um að umræðan um útiumhverfi sé tiltölulega ný hér á landi og taki ekki á öllum þeim þáttum sem eru taldir mikilvægir í tengslum við nám barna yfirleitt.

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I dedicate this thesis to my grandchildren, Anja Kristín, Lilja María, Sara Helena, Baldur Máni, and Iðunn Hekla, to whom the future belongs.

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1 Introduction

1.1 Children and the outdoors

There is a raised concern among people in countries, such as Australia, the United States of America (USA), the United Kingdom (UK) and Germany, about the extent to which children's opportunities to play outside and explore their surroundings have been reduced during recent decades (see for example Bögeholz, 2006; Louv, 2010; Tranter & Malone, 2008). In a now decade-old study from the USA, over 800 mothers were asked about their outdoor play in childhood as well as their children's outdoor activities. Of those surveyed, 70% reported they played outside each day as a child, but only 31% stated that their children did so. This was in spite of the mothers recognising the benefits of outdoor play (Clements, 2004).

In a large survey from the UK (Natural England, 2009) concerning changing relationships with nature across generations, it was also found that children in the UK play more inside (62%) than older generations did (36%) and they were also less likely to play in nature (less than 10%) than the adults did when they were young (40%). In a study of the use of the outdoors in 173 school districts in the USA, most school districts reported that the same amount of time is used for outdoor activities as before. Interestingly, however, more school districts reported that the time spent outdoors had decreased than those that reported it had increased. These findings support other research indicating that it is a national trend in the USA for children to spend less time outdoors (Burriss & Burriss, 2011). There may be many reasons for this. Children today have more opportunities for varied activities than children of previous generations, such as leisure activities, including sports and art classes. An Icelandic research project revealed that about 80% to 90% of children aged 6, 8, 11 and 14 participated in such activities from one to four hours per week. Furthermore, considerable time was spent in front of television and computers (Björnsdóttir, Kristjánsson, & Hansen, 2009). Other research has revealed that parents increasingly fear for their children's safety in the outdoor environment because of increased traffic and potential danger from strangers (Clements, 2004; Rickinson et al., 2004; Tovey, 2007).

The debate about children's decreased opportunities to experience the outdoors as well as the dominant discourse about the learning environment

being the indoor classroom have influenced my interest in how different stakeholders see the role of the outdoor environment in children's learning. The limited general discussion about the opportunities the outdoors can offer in children's learning and how the discussion is often isolated among those who are interested in outdoor learning has furthered my interest in this area.

1.2 The purpose of the research

In Iceland very few studies have been conducted on the use of the outdoor environment in preschool or compulsory school contexts (Einarsdóttir, 2005, 2011; Norðdahl, 2005; Óskarsdóttir, 2014). In order to contribute to the existing knowledge, I was interested to find out how stakeholders, such as policy makers, teachers, and children, think and act regarding the role of the outdoor environment in children's learning. This research is intended to be a critical investigation of the role that the outdoor environment plays in these different stakeholders' thoughts and actions regarding children's learning. This research can reveal how the policy makers, teachers and children think and act in regard to the outdoor environment, and this knowledge can be used to stimulate discussion regarding the importance of the place for children's learning. In this research, outdoor environment is defined to be schoolyards and playgrounds, as well as any outdoor areas within a reasonable walking distance from the school.

The overall purpose of the research was threefold:

- To increase understanding of the role of outdoor environment in the school curriculum and in children's lives in general,
- To enrich teachers' discussions about the use of outdoor environment in the school curriculum, and
- To contribute to landscape designers' and other decisions-makers' discussion about the role of schoolyards and preschool playgrounds in children's learning.

To accomplish this, four studies were conducted, each focusing on one aspect of the topic: the perspectives of policy makers, teachers and children's on outdoor environment, and teachers' use of the outdoors as a learning environment.

Policy is one of the factors affecting the decisions teachers make in their teaching, and, therefore, it was important to investigate how the official policy makers think about the role of the outdoor environment in regard to children's learning. Thus, discourse in policy documents was analysed to

determine if the outdoors is seen as a learning environment, and if so, in what way.

In the *ActionESD*, a research and development project for sustainable education in pre- and compulsory schools, the participating teachers used the outdoor environments in their teaching to various extents (see more on ActionESD, n.d). This made them suitable participants for Study 2, which aimed to find out how teachers think about the role of the outdoors in children's learning. In this project, three of the schools worked on a project about their school's outdoor environment, making it possible for me to investigate children's ideas and preferences regarding the outdoor environment, which comprised Study 3.

Through teachers' participation in a project aiming at creating continuity in children's learning between pre- and compulsory school, *On the Same Path* (see more on Center for Research in Early Childhood Education, n.d.), and through their use of the local outdoor environments, I was able to investigate how teachers in both pre- and compulsory school use the outdoors in children's learning, which comprised Study 4.

Thus, I investigated the role of the outdoor environment in children's learning from four different angles, as shown in Figure 1. These angles included: (a) the discourse in educational policy documents, (b) teachers' ideas, (c) children's ideas, and (d) teachers' use of the outdoor environment in teaching. Each of these four perspectives is discussed in detail in three articles and one book chapter that comprise the PhD thesis together with this introduction and a discussion where the overall findings are discussed and theorised.

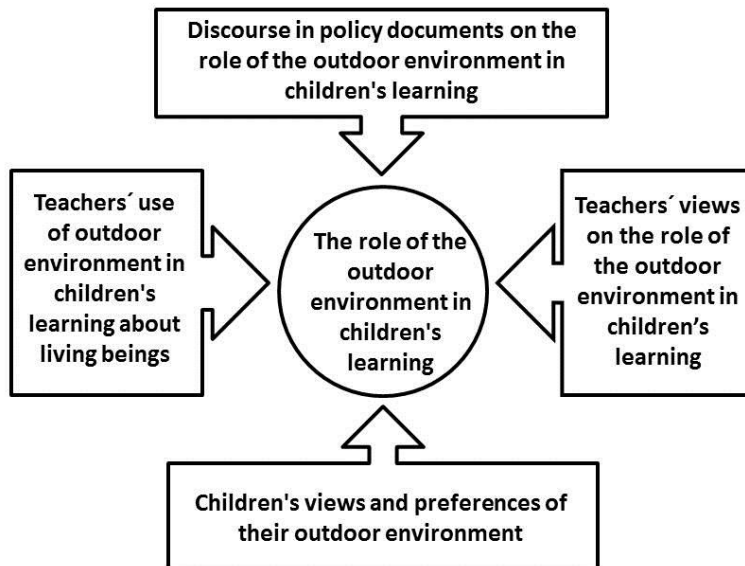


Figure 1 The four different angles from which the role of the outdoors is investigated

1.3 The context of the research

1.3.1 The outdoors and Icelandic pre- and compulsory school children

As this research focuses on the outdoor environment for children, it is relevant to examine the opportunities children have for being outside in their daily lives. Children in Iceland spend most of their time in preschools, compulsory schools and after-school programmes. Children attend preschool from an increasingly early age (one or two years old) and 85% of them spend eight hours or more there per day (Hagstofa Íslands, 2013). Children in compulsory schools have 30–37 learning sessions per week, 40-minute long each, and the schools operate for 180 days a year (The Compulsory School Act no. 91/2008). In Reykjavík, the capital and the largest city in Iceland, most of the youngest children in compulsory schools attend after-school programmes. In 2009, at least 83% of six-year-old children attended such programmes, as did 74% of seven-year-old children. Subsequently, attendance decreases, with 45% of nine-year-olds attending after-school activities, but only 9% of ten-year-olds (Pálsdóttir & Ágústsdóttir, 2011). In Reykjavík, 74% of after-school activities are located

in schools or in buildings on the schoolyards (The City of Reykjavík, n.d.). Thus, children are in these environments often up to eight hours a day.

The structure and culture of the different school levels give children different opportunities to be outside. In Icelandic preschools, children normally play outside for at least one hour daily in all types of weather. In compulsory schools, children's playtime in the schoolyard is mostly limited to set breaks, the longest of which are usually about 20 minutes, and the children commonly spend these breaks outside. Sometimes part of the teaching is conducted outdoors. However, in a recent Icelandic study only 1% of teachers surveyed said they used outdoor learning and field trips daily, 13% reported using these methods one to four times per week, 23% used them one to three times per month and the remaining 63% said they used them less frequently. Most of the teachers who used the outdoors most frequently were teachers of children from six to nine years of age (Sigurgeirsson, Björnsdóttir, Óskarsdóttir, & Jónsdóttir, 2014). However, most after-school programmes encourage children to play in the schoolyard. With all this in mind, it can be said that today, schoolyards and playgrounds constitute the outdoor environment most familiar to the youngest children. The schoolyard and the playground have taken on the function that other outdoor areas had in children's lives in earlier times, and it is, therefore, important to consider carefully what kind of experiences these settings can offer.

This research is about the policy, practices and views regarding outdoor environments in preschools and compulsory schools in Iceland and in Studies 3 and 4 the context involves mainly young children aged ten and under. In the research projects *ActionESD* and *On the Same Path*, the participants were preschool children aged four and five and preschool teachers as well as compulsory school children aged six to nine years and compulsory school teachers. In the analysis, I chose documents that were general to all school levels or inhabitants in municipalities, but for documents regarding schools I focused on preschool and compulsory school levels. The teachers who were interviewed regarding their ideas about the role of the outdoors were from preschools and all levels of the compulsory school; most of them taught the youngest (6–9 years of age) and middle level (10–12 years of age) school children, but some taught at the lower secondary school level (13–15 years of age). Thus, in brief, while the main context of the research involved preschool level children and their teachers, and the youngest children in compulsory school and their teachers, the studies have wider-reaching implications than solely for teaching of young children.

1.3.2 The researcher's interest and standpoint

In all research, the researcher is part of the context in which the research is conducted; more so in a project that is largely based on using interpretive methods. Therefore, I want to reflect briefly on who I am and the source of my connection to this area of study.

As a biologist, I have in my own education experienced the effectiveness of hands-on experiences when I was learning certain topics, for example about different organisms. In the biology at Lund University, for example, I gained such experience through extensive field courses that lasted many days. This experience influenced my view of learning outdoors.

As a long-time educator in science and nature studies (from 1985), I have been interested in the outdoor environment that children experience at school, considering both the kind of environment we offer children and also how this is used in their learning. I believe it is important for children to have opportunities in their daily lives to come into contact with and get to know their local natural environment and to get to know various natural phenomena, as well as their local community. I have emphasised that teachers should use the opportunities the outdoor environment offers in their teaching. I have also tried to increase teachers' and student teachers' awareness of how the character of an outdoor environment affects the opportunities it provides for children to experience natural phenomena such as plants, animals, water and different kinds of soil.

In my position as a teacher educator, I have also been involved in environmental education and sustainability education for many years and have done research in that area (Jóhannesson, Norðdahl, Óskarsdóttir, Pálsdóttir, & Pétursdóttir, 2011; Norðdahl, 2009; Norðdahl & Jónsdóttir, 2001). My experience and research in connection with a developmental project where preschool children were given the opportunity to play in a small wooded area have stimulated my interest in children's experiences of their outdoor environment and the role it may play in learning (Norðdahl, 2005).

I believe we should educate young children to become more responsible citizens in relation to nature and the environment, as well as towards their fellow citizens on this planet. I believe the outdoor environment can be useful in practicing this with young children. I participated in the studies included in this PhD thesis because I believe it is important to gain a deeper understanding of how the different stakeholders see the character, benefits, limitations, and obstacles of using the outdoor environment. However, I am, by no means, a neutral bystander about the role and value of the outdoor environment in children's learning.

1.4 Definitions of terms regarding the outdoor environment

As mentioned earlier, this research will consider the outdoor environment to be schoolyards and playgrounds, as well as any outdoor area within a walking distance from the school. Some of the terms regarding the outdoor environment need clarification, especially school outdoor environment, natural environment, natural playgrounds and green playgrounds or green schoolyards.

School outdoor environment is what we typically call the schoolyard or preschool playground, but this may also include other areas within walking distance from the school that are used for children's play, learning or physical exercise. *Natural environment* is different from *constructed environment*. This does not mean that the environment has been unaffected by humans. Trees, for example, are often planted in natural forests to make it more compact or to increase its diversity of species. In this way, the natural environment is not necessarily the same as nature, but it differs from parks and schoolyards, as there is no control on which organisms live there. A *natural playground* is a natural environment used as a children's playground. A *green playground* or *green schoolyard* refers to the same basic idea. Such playgrounds differ from traditional ones by imitating the natural environment. This is done by emphasising various natural phenomena in the area, such as rocks, sand, mud, water, and diverse organisms. These phenomena may have been there from the beginning or have been introduced by humans. These green playgrounds and schoolyards are often a mixture of natural and constructed environments.

1.5 Structure of the thesis

The introduction to this thesis presents the issues I have investigated in this research, the purpose of the study and the context in which the sub-studies of the whole research were performed. In Chapter 2 the background of the research is discussed. Concepts drawn from relevant theories that have influenced the research are considered, as well as previous research findings in the area. The overall research design is presented in Chapter 3. Chapter 4 contains a summary of the findings in each of the four studies, and the overall findings of the whole research project are clarified. In Chapter 5, these overall findings are discussed in the light of the relevant concepts, theories and previous research findings. Chapter 6 includes final word and identifies some implications of the findings.

2 Background of the research

In this chapter I will discuss the theoretical background of the research and previous research findings about different views and actions regarding the role of the outdoor environment in children's learning.

2.1 Theoretical background

The four studies in my research address how different stakeholders, policymakers, teachers and children view the role of the outdoor environment in children's learning and how teachers used it. Various concepts drawn from different theories have influenced the research questions and helped me to understand diverse aspects found in the data. This variety of concepts helped me to recognise differences in ideas on the role of the outdoors in children's learning. This contributed both to a greater depth and breadth in the data analysis.

In this chapter, I discuss the concepts that are of importance in understanding the role of the outdoor environment in children's learning. In Table 1 concepts drawn from different theories used in each of the four studies are summarised. Foucault's theory of the discourse is the base of the method of historical discourse analysis used in Study 1, and because I do not use it in a broader way, I discuss it in relation to the method in the research design chapter.

Gibson's concept of *affordance* helped me to understand how the role of the outdoors could be seen as functional opportunities that could be offered to teachers and children. I used it in Study 2 and Study 3. The concept of *place* drawn from place-based theories is important when discussing the role of outdoor environment in children's learning from the point of view of teachers and children as I do in Study 2 and Study 3 and how teachers use the outdoor environment as shown in Study 4. The concept of *experience* drawn from Dewey's theory of experience and education is also of importance when discussing ideas and actions of teachers regarding the role of the outdoors in children's learning as seen in Study 2 and Study 4. Also the pair of concepts, *communication and culture*, are valuable when discussing the outdoor environment as a venue for learning as a social practice as presented in Study 2 and Study 4. The concept of children's *participation* is one that has been useful in my research when discussing the outdoors as a venue for learning through participation as seen in Study 2 and Study 3.

Study 1 (Article 1)	Study 2 (Article 2)	Study 3 (Article 3)	Study 4 (Book Chapter)
Children's outdoor environment in Icelandic educational policy	Let's go outside: Icelandic teachers' views of using the outdoors	Children's views and preferences regarding their outdoor environment	Early childhood teachers' (pre- and compulsory school teachers) use of the outdoors in educating children about living beings
<ul style="list-style-type: none"> • Power of the discourse 	<ul style="list-style-type: none"> • Affordance • Place • Experience • Communication and culture • Participation 	<ul style="list-style-type: none"> • Affordance • Place • Participation 	<ul style="list-style-type: none"> • Place • Experience • Communication and culture

Table 1 Overview of concepts used in each study

2.1.1 Affordance

The key concept used mainly in Studies 2 and 3 is Gibson's (1979) concept of affordance of the environment. He used the concept of affordance for the potential activities of people or other living beings in their environment. He saw people's actions mainly as a consequence of how they recognise the possible activities the physical environment can offer or the affordance of the environment. Thus, the affordance includes both features of the environment and people's behaviours and actions. This always depends on the ability and perception of the person involved to use the environment in a certain way, so the affordance of the environment is not necessarily the same for all people. For example, a rock can afford a school-age child the

opportunity to climb on it (if the child finds it climbable), while the same rock would not afford this opportunity to a toddler but may instead afford the toddler some support when beginning to walk (if the toddler wants to use it in that way). Therefore, the concept of affordance is not simply about the possibilities offered by the environment, but also concerns how each person perceives and uses that environment. Thus, it is about the interaction between people and their environment.

Gibson (1979) states that an object affords children to do is what interests them first, not the quality of the object. According to Greeno (1994), Gibson focuses on the contribution of the environment in inviting people to the kind of interaction that occurs between the environment and the person involved. Heft (1988) argues likewise when discussing the psychological resources of children's outdoor environment it is useful to refer to the feature of the outdoors in regards to its functional significance for children. Heft also created a functional taxonomy of children's outdoor environments depending on the kind of activity or behaviour it afforded. In this he describes the different affordance of the environment as, for example, 'graspable', 'climbable' or 'moldable' (Heft, 1988, p. 36). Kytä (2002) describes different levels of affordance as seeing the affordance of the environment as potential, perceived, utilized and shaped. She also discusses how social rules and practices influence the actualisation of the affordance or 'the field of constrained action', meaning how adults promote or constrain the child's potential affordance available (Kytä, 2002, p. 109). These social rules and practices concern how people either encourage children to utilise the affordance of the environment or forbid or discourage them to do so. According to Kernan (2010), it can be useful for stakeholders in early childhood education to analyse the outdoors in terms of perceived and utilised affordances when planning outdoor areas for their play and exploration. This research primarily focused on how teachers and children viewed the potential affordances the outdoor environment offered (Studies 2 and 3) where the ideas of teachers and children in this regard were studied.

2.1.2 Place

Place is a concept that has in recent decades become increasingly important in the discussion of using the surroundings as a venue for connecting to it, learning in it, learning about it, and taking action for it. The place in this respect is not necessarily out-of-doors; it could also be indoors, but here it is used in the context of school outdoor environment.

In this research the school outdoor environment is seen as children's school grounds and school playground as well as the outdoor environment in the walking distance from the school. Thus, place-based theories of learning (Smith & Sobel, 2010) that emphasise connecting learning to the local environment and community for the purpose of further pupils' achievement and foster partnership between school and communities have influenced my research.

The word *place* can be seen as a distinct geographic localisation with certain margins (Szczepanski, 2013) but also as a place with physical and ecological qualities as well as a social construction (Gruenewald, 2003a). Gruenewald (2003a) indicates that everyone experiences place on an individual basis, and the learning that results from that experience may affect one's identity and relationship with others. The concept *sense-of-place* has to do with the relation between an individual and place which is part of one's cultural identity, and can refer to the environment as a specific district, a whole land or nation (Szczepanski, 2013). Thus we can see places as a product of our culture, or as Greenwood (2013, p. 93) states, 'places can be thought of as primary artefacts of human culture—the material and ideological legacy of our collective inhabitation and place-making.'

Place-based education uses the local community and environment and children's lived experiences as grounds for learning, instead of reading texts, listening to others or viewing videos (Smith, 2002). In place-based education, both the cultural and natural environments are used (Smith, 2007). Thus, factories or other industrial places as well as the diverse institutions of the local community are places in the environment to learn in and from as well as the outdoors environment. Gruenewald (2003b, p. 620) points out that the aim is to break the isolation of schools from the 'living world' outside and react against the 'placeless institution of schooling'. Therefore, it is important, as Szczepanski (2013) argues, in an educational context not only to rely on places like the classroom, but to also consider other places that could be beneficial for teaching and learning.

When place is included in the school curriculum, children's experiences become a foundation of their learning (Gruenewald, 2003b; Smith, 2013). Lundgren (2006) indicates that instead of teaching about different phenomena, concepts and processes from a distance, as seems to be the norm in school organisation, teaching should be placed in the environment where a real physical encounter is possible (cited in Szczepanski, 2013).

The aim of place-based education is to foster 'both community and environmental renewal' (Smith, 2013), and as mentioned previously, it is a way to connect children with their community and local environment in a historical, cultural, ecological and social way (Gruenewald & Smith, 2008). Gruenewald (2003b p. 620) refers to place conscious education that aims at learning from 'firsthand experience of local life and in the political process of understanding and shaping what happens there'. This prepares the children for taking part in democratic processes and finding solutions to problems they may face both socially and environmentally (McInerney, Smyth, & Down, 2011). If and how people connect to a place and their different attachment to a place is important in their choice of where to live and their willingness to participate as citizens in protecting the quality of the social and natural environment (Avriel-Avni, Spektor-Levy, Zion, & Levi, 2010). Thus, helping people to make this connection or attachment is seen as significant for the society.

Even if place-based theories refer to education in general, these theories have been criticised (Nespor, 2008, p. 484) for 'inattention to racism, classism, ableism, and gender-based discrimination'. Nespor (2008) points out that ethnicity, race, disability, and gender issues have been addressed in the literature in connection to place, and it would be a contribution for both theory and praxis to include them in the discussion on place-based education in a more direct way. Additionally, he suggests that focusing on the local does not always help people realise that their lives and culture are also linked to other places (global) often far away. McInerney et al. (2011) also indicate that even if the local community is a good place to start, it is also important for children to learn about other places, times, and cultures to gain an understanding of themselves and their circumstances as well as an understanding of the entire world and how they can affect it.

The concept of place has mainly influenced the research question focusing on the role of the outdoors. However, it has also influenced the data analyses directing the focus on places of value for the participants and how places are seen and used in the four different studies. This concept is mainly used in the analysis in Study 2, which concerns teachers' ideas of the role of the outdoors; in Study 3, regarding children's ideas and preferences of their outdoors; and in Study 4, when analysing how teachers use the outdoors in their teaching.

Although the theories of place-based education have addressed concepts as experience, culture and participation, other theories have also been used that address these concepts, sometimes in a slightly different way. Thus I will discuss them here as well.

2.1.3 Experience

In young children's learning, the importance of experiencing the physical environment, and particularly children's interactions with it, is emphasised. Often people see activity and experience as identical and take for granted that children will experience things if they are active. Here the concept of experience is drawn from Dewey's theory of experience and education (1938/2000).

The importance of experience has been the core of outdoor education for a long time drawing on Dewey's (1938/2000) theory of experience and education (Quay & Seaman, 2013). As one of the founders of pragmatism, Dewey argues that learning is a practical process based on experience. Pragmatism builds on empiricism, where the search for knowledge is based on experience or perception. It places a greater emphasis on doing rather than receiving, i.e., the activity of individuals instead of passivity (Jónsson, 2010). As an extension of this, Dewey (1916/1966, p. 139) explains that experience involves two elements: an active one and a passive one. The active element of experience involves trying out things or acting on something, for instance when experimenting with things. The passive element of experience has to do with thinking about what happens when trying out things. Thus the passive element of experience is about undergoing the consequences of the activity or realising what happens when trying out things. The peculiar combination of these two elements is what experience is about and has to do with the value of the experience and its educational contribution. Therefore Dewey argues that children do not learn from their activities alone; rather, they learn from reflecting on their activities and learn from the effects their activities have. Thus, learning from experience is the ability to reflect on the combination of what one does and the consequences of the event.

Dewey (1938/2000) emphasised that experience is always in a certain context or environment, and it is important for teachers to consider what kind of environment is likely to further children's development. Experience, according to Dewey, involves communication between the individual and the environment. The environment can be the people with whom the individual is having a discussion, the issue that is discussed, a toy a child is playing with, a book one is reading or an experiment one is doing. This study focuses on the experiences the outdoor environment can offer.

However, it is worth noting, that, according to Dewey (1938/2000), not all experiences are beneficial for children's education, and the distinctions between positive and negative experiences in that regard. An experience

that negatively affects children's future experience in the long term is a negative experience and not educational. He criticised schools for offering non-educational experiences, meaning that schools offered experiences that hindered children's development, made them lose their interest in learning and did not help them to connect what they learned in school to their real lives. Therefore, it is important to be aware of how experience affects children and to use this awareness in creating opportunities at school for children to have experience that is educational for them now and in the future (Dewey, 1938/2000). In this way, Dewey saw education as a reconstruction of experience (Dale, 1996). Thus, it is important for teachers to think about what kind of experience is likely to promote children's interests and motivate them to participate in the activities teachers plan, and how to choose activities that promote useful experiences for children in the future.

Dewey emphasised continuity in children's experiences, such that one experience would build on a former experience; in the same way as how the preschool builds on children's experiences from home and the compulsory school builds on experiences from the preschool. This is a way to create a continuous thread of experiences. Dewey stressed that teachers should ensure the balance between the old and the new, the local and the distant, the known and the unknown. Thus, it is important in children's education to use the old, the local and the unknown as a ground for learning about new things, the distant and the unknown (Einarsdóttir, 2010).

The concept of experience is important in this research when analysing the ideas of teachers about the role of the outdoor environment in children's learning in Study 2. This concept is also important in analysing how the teachers in Study 4 used the outdoor environment in children's learning, but this concept is underlying in the other studies as well.

2.1.4 Communication and culture

Even though experience involves reflection, there are many things children cannot learn from their own experiences—things they must learn from other people or from others' activities. Here I will discuss how culture and communication between people can affect learning.

Socio-cultural theory draws on Vygotsky's work on the importance of social interaction for children's learning and focuses on the impact of culture on how and what children learn. Säljö (2001, p. 30) argues that culture is 'the collection of people's ideas, attitudes, knowledge and other

resources we acquire through interaction with the outside world'. Rogoff (2003) draws our attention to how the culture appears in people's participation in the traditions and cultural practices of their own communities. For instance, in Iceland it is seen as good and healthy for baby's to sleep outside in their baby carriage for an hour or two during the day. In another country, such as the USA, parents would be considered incompetent and could even be at risk of being accused of neglect for doing the same thing. Rogoff (2003) argues that it is our cultural experience that determines what is seen as good or bad for children as in the example of above. Often we are so interwoven into our community's way of doing things that we take it for granted that our way of doing things is the right way. Therefore, it is often difficult to point out one's own cultural practices.

As previously mentioned, culture involves people's ideas, attitudes and knowledge as situated in a specific time and place, but it also involves the products people make from their ideas and knowledge (Säljö, 2001). Thus, knowledge is involved in people's activities, professions, entertainment, technology, literature, arts and spoken language making it possible for children to learn from and through culture both in formal and informal ways. They learn from their parents, friends and other pupils, relatives as well as other members of the community (Vygotsky, 1978).

Säljö (2001) pointed out that part of each culture is also represented in the physical tools or artefacts we use in daily life, such as a hammer, a wheelbarrow, a mixer, a mobile, a computer or a car. Language has also been seen as a tool to use in communicating information. He further claims that communication or interaction between people is what creates the culture and it is also through communication the culture is brought forward to others. Thus, discussing and interacting with peers and adults is seen as important in children's learning (Vygotsky, 1978).

Language is considered to be important for the development of thought and seen as the main tool of thinking (Vygotsky, 1978). It is not only a tool that makes it possible for us to interpret how we see the world, but is the basis of thinking and forms the process of thoughts (Wood, 1992). Thus, children can only learn and develop their understanding by communicating with the participants in the culture involved. Scott, Asoko, and Leach (2007) point out that in this context scientific knowledge, for example, is created in the community of natural scientists, and children cannot discover it, solely, by experiencing the physical environment.

Thus, it is not only the opportunities the environment offers that stimulate a child's learning, but also the accessibility to those who can help

children understand what is there. The quality of interaction between the children and their teachers, such as if and how the teachers use scientific concepts and help children in their explorations, has also been found to be important (Fleer, 2010; Gustavsson & Pramling, 2014; Klaar & Öhman, 2014).

These concepts were used in the analysis of data in Study 2, on how teachers saw the role of the outdoor environment and in Study 4 on how teachers used the outdoor environment in children's learning about living beings. These concepts are underlying in the other studies as well.

2.1.5 Participation

Here I will discuss the concept of participation, beginning with children's rights and participation in a democratic society. Then I will discuss children's participation in environmental education and sustainability education as part of my data was collected in connection with an educational research project on sustainability education.

2.1.5.1 Children's rights to participate

In the past decades there has been increasing interest among researchers in children's rights and participation in society. These researchers see children as capable, competent and active thinkers from whom adults can learn (see, e.g., Clark & Moss, 2001; Dahlberg & Moss, 2005; Einarsdóttir, 2007; Harcourt & Einarsdottir, 2011; Schiller & Einarsdottir, 2009). Children are seen as citizens with their own rights and competencies to participate in society, rather than as future citizens (Einarsdóttir, 2012). The Convention on the Rights of the Child (United Nations, 1989, 2005) is based on the view of the competent child and has affected how people view children, emphasising that children have the right to participate in decisions about their own lives and conditions. In Iceland, one of the main objectives of schools is to prepare children for participation in a democratic society (The Preschool Act, No. 90, 2008; The Compulsory School Act, No. 91, 2008).

Viewing children as competent and participating in society, has focused researchers' and practitioners' attention on the importance of listening to children's voices (Waller, 2006). In this context it is important to consider that children are not all the same; they do not present a singular viewpoint but rather a multiplicity of viewpoints and this must be taken into account to prevent some children being listened to but not others (Dockett, Einarsdottir & Perry, 2009). Warming (2005) also points out that children's views, like anyone else's, can change over time and in different contexts.

It is not enough to listen to what children have to say, it is also important to take what they say seriously and act upon it (Brooker, 2011; Einarsdóttir, 2012). Regarding children's participation in projects involving changes, Percy-Smith and Thomas (2010) have emphasised the process of participating in the changes as most important, not the outcomes of those changes. Mannion (2007, 2010) points out that children's participation is dependent on adults and that we should recognise this dependence and look more closely at the relationship between children and adults. Waller (2006, p. 77) points out that children's 'agency is seen as children's capacity to understand and act upon their world' and actively co-construct their own lives, their own cultures, have their own activities, times and spaces. Here Waller (2006) warns against looking at children as a homogenous group, instead of diverse groups depending on their age, gender, ethnicity, culture and inequalities.

Recently, the manner in which listening to children is inscribed in the rights discourse has been criticised, suggesting that it may result in two opposing images of the child: as vulnerable and dependent or as autonomous and competent (Kjørholt, Moss, & Clark, 2005). Lansdown (2010) points out the importance of balancing children's right to participation and their right to protection.

Quennerstedt and Quennerstedt (2014, p. 130) argue that as research on children's rights needs sociological theory emphasising the social and political characters of childhood, such research also needs educational theory focusing on the opportunities education has for the child to 'grow as a holder of human rights'.

2.1.5.2 Participation in environmental education and sustainability education

In environmental education, and later in education for sustainable development, children's participation in environmental projects has been seen as valuable. In environmental projects children's involvement in decisions relating to the environment is emphasised, and children are encouraged to act on their decisions about things and events they experience, in ways that are connected to their own well-being and to that of others (Breiting, 2008).

Quay and Seaman (2013) point out in a historical review of outdoor education in the USA that in the 1960s public concern about environmental problems increased. Many saw outdoor education as an ideal educational response to that, as knowledge about the environment could be the main subject of outdoor education, making it more distinct and legitimate. This

changed outdoor education, introducing a focus on subject matter as well as on the method of direct experience. Adventure education, where the emphasis is on outdoor sports, and experiential education, where the method of carefully chosen experiences and a cycle of action-reflection is highlighted, both emphasise the process of learning instead of the content. Adventure education and experiential education emphasise personal growth and social relations with others more than learning about the environment.

Some scholars argue for the importance of empowering children so they can see themselves as actors of change in their own lives and in their environments (Davis, 2010; Ferreira, 2013; Percy-Smith, 2010; Ärlemalm-Hagsér, 2012). In sustainability education in schools, it is seen as important to use the local community and the outdoor environment, so children can learn about it and participate in it (Ardoyn, Clark, & Kelsey, 2013; Kozak & Elliott, 2011). It is also considered significant in developing their action competence (Breiting & Mogensen, 1999; Jensen & Schnack, 1997).

The concept of participation guided the research questions, especially in Study 3 investigating children's preferences and ideas regarding their outdoor environment. This concept was also used in the data analysis in that study. In Study 2, when investigating teachers' ideas about the role of the outdoor environment, this concept was also important.

2.2 Previous research

In this chapter, research findings regarding different views of teachers and children about the affordance of the outdoor environment in children's learning are discussed. Research findings of how teachers use the outdoor environment in children's learning about nature are also discussed. This discussion is divided into five subchapters: 1. The status of the outdoors in children's lives. 2. How the outdoors is seen as a learning environment. 3. How the outdoors is seen as good for children's health. 4. How children's risk and safety outdoors is viewed and 5. How the outdoors is seen as important in forming attitudes and actions regarding the environment.

2.2.1 The status of the outdoors

In Nordic countries, the outdoor environment is highly valued in children's lives, and there is a culture of seeing children's outdoor play, especially in nature, as part of a good childhood (Bergnéhr, 2009; Einarsdottir, 2006; Garrick, 2009; Halldén, 2009; Nilsen, 2008; Waller, Sandseter, Wyver, Ärlemalm-Hagsér, & Maynard, 2010). Many studies reveal that teachers

share this view and find it important for children to play and spend some time outside (Björklid, 2005; Ernst & Thornabene, 2012; Fägerstam, 2013; Magntorn & Helldén, 2006; Moser & Martinsen, 2010; Szczepanski & Dahlgren, 2011).

The emphasis on the beneficial impact of nature in children's learning can also be seen in the growing number of nature preschools in the Nordic countries (Borg, Kristiansen, & Backe-Hansen, 2008). Consequently, in the Nordic countries the outdoor environment in preschool is seen as a part of the learning environment and a central part of the day in preschool takes place outside. However, this is not the case in some other countries like the UK and Ireland (Kernan, 2010; Maynard & Waters, 2007), even if a stipulation for regular outdoor experiences has emphasised this in the UK curriculum since 2007 (Joyce, 2012; Tovey & Waller, 2014).

Research findings about children's perspectives on the outdoors in general have shown that children in many countries like to be outside and want to spend more time outdoors (Clark, 2007; Clark & Moss, 2005; Malone, 2006; Stephenson, 2003) and the outdoors areas are the most popular places in schools (Burke, 2005; Einarsdóttir, 2005, 2011). Children highly value the natural environment and prefer natural environments to constructed ones (Lucas & Dymont, 2010; Malone & Tranter, 2003; Titman, 1994; Waller, 2006). A study of the affordance of the outdoor environment in Finland and Belarus (Kyttä, 2002) found that children noted the largest number of affordances in the least urbanised environment or with the most natural environment. Kyttä's (2002) study also indicated that children found more affordances in the environment they knew well.

In summary we can say that research tell us that in the Nordic countries being outdoors, especially in nature, is seen as part of a good childhood. This emphasis on using the outdoors can also be seen in the curricula of many schools called 'outdoor schools'. Some studies have shown that children like to be outside and want to spend more time outside, and children highly value the natural environment.

2.2.2 Outdoor environment and learning opportunities

Bergnéhr (2009) analysed the discourse in the Swedish journal *Förskolan* [E. *The preschool*] which is a journal for preschool teachers. According to her findings, the outdoor environment was seen as stimulating children's learning by awakening their curiosity and interest. Kernan and Devine (2010) found in their discourse study that the outdoors was seen as providing opportunities to use all senses to discover and explore nature. In

outdoor education or learning, the experience is highlighted as the most central aspect and its importance for children's learning is emphasised (Jordet, 2010; Szczepanski, 2014). According to research findings about teachers' ideas of the outdoors in children's learning, compulsory and secondary school teachers (Fägerstam, 2013; Magntorn & Helldén, 2006; Óskarsdóttir, 2014; Szczepanski & Dahlgren 2011) also stress the importance of children's outdoor experiences for learning. An example of this is a survey of teachers' experiences of school gardens revealed that teachers from USA, Finland, Sweden and UK found that a school garden programme improved children's learning (Education Development Center and Boston Schoolyard Funders Collaborative, 2000). Furthermore, teachers viewed using the outdoors as a way to cater to children's different ways of learning and to create diversity in their teaching (Óskarsdóttir, 2014). Children themselves have expressed a longing for exploring aspects of the outdoors, for example water, animals and plants (Burke, 2005; Clark, 2007; Kernan, 2007; Malone & Tranter, 2003; Mårtensson, 2004; Titman, 1994; Waller, 2006).

Despite the importance of experiencing the physical environment, research has revealed that experience is not sufficient for all kinds of learning; for instance, learning scientific concepts (Fleer, 2009; Siraj-Blatchford & Siraj-Blatchford, 2002). In Ejbye-Ernst's (2012) research in a Danish nature-preschool emphasising children's free play in nature, the teachers assumed that the children would learn about the natural environment through their experiences. As a result of this assumption, the teachers did not use the opportunities the environment offered to teach children about nature. Quite the opposite was shown in studies of Norwegian nature preschools, where the teachers used the outdoors to extend children's enquiries about nature (Änggård, 2012; Fjörtoft, 2000).

It is not only the opportunities that the environment offers children that stimulate their learning, but also the interaction with others and the quality of the interaction that are seen as important, such as if and how the teachers use scientific concepts and help children during their explorations (Gustavsson & Pramling, 2014; Klaar & Öhman, 2014). Listening to children, supporting their enquiries and discussing their hypotheses regarding different issues have been emphasised in young children's learning (Änggård, 2012; Fjörtoft, 2000; Harlen, 2006). Sometimes, however, the children will not come to a conclusion or find an answer to a question, and then it is recommended that the teacher support children's learning by explaining and answering the questions.

In a Swedish study of teachers' and children's discussions about science in a preschool, Thulin (2011) characterised these discussions as following traditional patterns in which teachers ask questions and children respond. In that study, since the teachers responded to questions that the children asked by asking additional questions, the teachers sometimes did not answer the questions, which caused the children's attention to wander on other things. It also appeared that when children had more time to become familiar with the subject, they raised more questions about it and their questions became more diverse. Thus, it was recommended to give children time to investigate as well as take their questions seriously and help them to find answers.

There seem to be conflicting perspectives in the area of early year's education, regarding children's free play in their learning in Icelandic and other Nordic studies. Teachers either see children's free play as something the teacher should not interfere with or control, or as an objective-driven learning process in which teachers can be involved (Ärlemalm-Hagsér, 2008; Einardóttir, 2010; Hreinsdóttir & Einardóttir, 2011).

Pramling Samuelsson and Carlson (2008) argue that play and learning in early year's education were intertwined and hard to distinguish one from the other; viewing play as the child's way of learning and learning as involving play dimensions. To support children's play and learning teachers need to listen carefully to what is occurring in the play and use children's ideas and perspectives as a starting point for giving inspiration to play and learning and to encourage them in the process of making sense of the world (Pramling Samuelsson & Carlson, 2008).

What about children's play and learning in science? Østergaard (2005) found that children's free play had a lot in common with the methods of natural sciences, as children essentially formulate hypotheses, make observations and conduct experiments to test the hypotheses and reflect on what happens. Thus, creating conditions for children's play with materials that offer different experiences could stimulate children's interest and learning. Research has revealed that children learn various concepts through play and experimentation, but as mentioned previously, children's free play does not necessarily extend their understanding of scientific concepts (Fleer, 2009; Siraj-Blatchford & Siraj-Blatchford, 2002). To learn and understand such concepts, children must be in contact with people who have mastered these concepts (Guðjónsson, 2008, Scott, Asoko, & Leach, 2007). Studies in preschools, where children played freely with materials, show that teachers' intervention in play was crucial to their

learning about physical and biological concepts (Fleer, 2009; Siraj-Blatchford & Siraj-Blatchford, 2002).

A Swedish study of the views of compulsory school principals of the schoolyards indicates that the outdoor environment most accessible for children, the schoolyard, is not seen as part of the teaching environment. Only one out of four Swedish compulsory principals regarded the schoolyard as a teaching resource, with most seeing it as a place for children's play and social interactions (Paget & Åkerblom, 2003). In a British study (Titman, 1994) compulsory schools teachers also saw the school ground mainly for playtime and it was rarely used for anything else.

The children in Titman's study (1994) saw the schoolyard as part of the school, a place that they spent some time and believed was designed for them. If the school grounds met their needs and preferences of what to do outside, they interpreted it as the school personnel valuing them. However, if the school grounds did not meet their needs, i.e., it was uncomfortable, unpleasant or littered, the children interpreted this as the school personnel neither caring about them nor the environment. This was reflected in children's behaviour on the school grounds. If they felt 'the school' valued the environment, the children also did so; if not, in some cases children adopted that view and made a bad situation worse.

To summarise, previous research has shown that teachers see experience gained outside as important for children's learning. Some studies have revealed the importance of reflection on and discussion of the experience gained outside for the learning process. Thus, free play outside is not sufficient to learn some scientific concepts; teachers have to be involved and introduce these concepts to the children. Research also tells us that teachers do not see the schoolyard as a place for teaching, but rather as a place for play and social interaction. Children see the schoolyard as part of the school and how it is designed and maintained affects their behaviour and feelings.

2.2.3 The healthy outdoors

Research on the connection between the outdoor environment and children's health is growing; for instance, there is research about the positive relationship between children spending time outside, especially in nature, and their physical health and mental well-being (for example, Davis, Rea, & Waite, 2006; Fjörtoft, 2000; Hinkley, Crawford, Salmon, Okley, & Hesketh, 2008; Taylor, & Kuo, 2009). In Bergnéhr's (2009) analysis on discourse in articles on nature and childhood, the outdoors is seen as

beneficial to children's health, both physically and mentally, and is also seen as stimulating creative play and social development. Studies from many countries have revealed that both preschool teachers and compulsory school teachers believe this as well (Björklid, 2005; Davis, 2010; Earnst & Thornabene, 2012; Kernan & Devine, 2010; Szczepanski, Malmer, Nelson, & Dahlgren, 2006). Findings from studies investigating children's preferences for various outdoor activities show that they enjoy opportunities for physical movement (Fjörtoft, 2004; Kernan, 2007; Niklasson & Sandberg, 2010; Waite, 2007).

In studies of children's preferences regarding the outdoor environment, children expressed ideas about activities that can be categorised as having to do with their physical and mental health. They expressed desire for and enjoyment of contact with other children (Clark & Moss, 2005; Einarsdottir, 2011; Perry & Dockett, 2011) and adults, and indicated that places for communication in the outdoors were important to them (Clark, 2007, 2010; Kernan, 2010). In this regard, many studies indicate that children like to establish their own places (Änggård, 2012; Fjörtoft, 2000; Kernan, 2007; Kylin, 2003; Niklasson & Sandberg, 2010; Waller, 2006, 2007) to use for various purposes such as to relax without interruption (Änggård, 2012; Clark, 2007; Einarsdóttir, 2005; Fjörtoft, 2000; Kernan, 2007; Kylin, 2003; Titman, 1994; Waller, 2006). Others wanted to use these places to play with friends and communicate with adults (Clark, 2007, 2010; Clark & Moss, 2005; Einarsdottir, 2011; Perry & Dockett, 2011; Kylin, 2003; Titman, 1994) or to enjoy the view of their surroundings (Kernan, 2007). Malone and Tranter (2003) found that compulsory school children played outside mostly in small groups and less frequently in large groups, and that large open spaces were not used as much as small spaces.

In summary, research findings about the positive effects of the outdoors on children's health are growing. Teachers also view being outdoors as good for children's physical and mental health. Research findings of children's preferences and views on outdoor activities reveal that children like to move around and enjoy the opportunities for physical activity that the outdoors offers. Children also like to be in contact with other children and adults, create or find their own places to be with their friends, relax and have some privacy or enjoy the views.

2.2.4 Risk and challenge

Risk and safety are prevalent parts of the discourse regarding children and the outdoors. In many countries, teachers and parents are concerned about

risks in the outdoor environment (Kernan, 2010; Kernan & Devine, 2010; Rickinson et al., 2004). Preschool student teachers in the USA mentioned safety concerns as one of the reasons for not wanting to use the natural environment in children's education (Ernst & Tornabene, 2012). Kernan and Devine (2010) found contrasting views regarding children's safety in the outdoors. On one hand, there are views about the dangerous environments from which children need protection, and on the other hand, the outdoors is seen as an educational environment important for children to experience.

This concern of taking children outside has developed in recent years, and Stephenson (2003) sees it as the impact of the discourse about the dark side of risk, emphasising the possibility of failure and injury. Kernan and Devine (2010) also found that safety regulations and the potential threat of lawsuits in case of accidents made it difficult for teachers to take children outdoors. In a literature review about risk and play, Gleave (2008) concluded that despite various efforts to minimise risk, the public's fear of hazard and danger has, in fact, increased. She claims that fear of risk is a social construct rather than a belief based on facts, and that the media plays an important role in this construct. This has caused parents to become overprotective of their children, resulting, as Malone (2007, p. 513) phrases it, in a bubble-wrap generation in which parents want so much to protect their children that the children are deprived of opportunities to be 'competent and independent environment users'.

Physical challenges and risk-taking are among the possibilities the outdoor environment often offers children, which many enjoy (Little & Eager, 2010; Sandseter, 2009; Stephenson, 2003; Titman, 1994). Sandseter (2009) found that both ordinary playgrounds and natural surroundings used as playgrounds provided many opportunities for preschool children to engage in risky play, although natural surroundings involved a higher degree of risk-taking than ordinary playgrounds. Children's risk-taking is something that seems to be more recognised and valued by teachers and other practitioner in the Nordic countries than in countries such as the USA, the UK and Australia (Ernst & Tornabene, 2012; Kernan, 2010; Little, Sandseter, & Wyer, 2012; MacQuarrie, Nugent, & Warden, 2015; Sandseter, 2012; Waller et al., 2010).

In summary research has revealed that adults are worried about the risks of danger children can face outdoors, and this often results in overprotection. How people view this threat in different countries is affected by the status of outdoor play in those countries, as in Nordic countries teachers support children's risk-taking more than in other part of

the world where outdoor play is not as positively viewed. Children themselves have been found to enjoy taking risks in the outdoors, and a natural environment seems to support opportunities for risk-taking.

2.2.5 The outdoors affecting views and actions towards nature and environment

It is a widespread notion that children's sensuous experience of nature is something that affects their views on nature and their willingness to protect nature as they mature. Two Icelandic discourse analyses of policy documents regarding education for sustainable development found that these documents expressed that use of the outdoor environment is helpful in creating environmental awareness in children (Jóhannesson, 2007; Jóhannesson et al., 2011). Several scholars have stressed that positive experiences with nature and emotional attachment to nature in childhood are important in motivating people to respect the natural environment in adulthood and take action to preserve it (Davis, 2010; Louv, 2010; White, 2004). Further studies have supported this relationship to some degree (Bögeholz, 2006; Chawla, 1999; Wells & Lekies, 2006), but acknowledge that social and cultural factors also matter.

A study of Norwegian young people's (ages 15–19) narratives of their childhood experiences of nature (Gurholt, 2014) revealed that the outdoor life children experienced affected their behaviour in nature, like picking up litter and being aware of leaving nothing behind. In that sense, some described themselves as caring towards nature and showed responsibility and a willingness to protect their environment. Some of the teenagers were worried about waste in the sea, and others mentioned activities that they themselves could do to lessen the load on the environment, like using sailing boats or boats with small motors instead of speedboats. These youngsters saw protecting nature as something that was important to do because humans would not survive without nature. None of these 200 teenagers saw themselves as green activists, nor did they refer to global environmental problems in their narratives.

Research findings indicate that preschool teachers (Ärlemalm-Hagsér, 2013), compulsory school teachers (Szczepanski & Dahlgren, 2011) and personnel from environmental educational centres as well as upper secondary school teachers (Fägerstam, 2012; Hill & Brown, 2014) have also found that encounters with and knowledge about the environment were important for shaping children's and young people's environmental concern as well as developing their place identity. Rickinson et al. (2004), however,

noted that research findings do not support the hypothesis that nature experiences automatically further children's environmental awareness and action. Gurholt (2014) argues that there is no linear and predictable relationship between humans and nature, but that experiencing nature is important and that a combination of cultural, political and environmental processes are needed for such experiences to become part of one's self. Sandell and Öhman (2010) point out that in the 1980s the connection between outdoor experiences and people's willingness to take care of nature and do something to preserve it was seen as the main role of outdoor education. They state that a more pluralistic approach to environmental education in later years has created the danger of people's relation to nature being neglected in environmental education and later in sustainability education (SE). The outdoor environment has also been seen as a positive means for learning about the place of humankind in nature, and, therefore, it helps to improve human behaviour in nature (Ärlemalm-Hagsér, 2013; Davis, 2010; Fägerstam, 2012, Szcepanski & Dahlgren, 2011).

Children's participation and democratic education are also part of the discourse on the outdoor environment. Aasen, Grindheim, and Waters (2009) argue that the outdoors is very important for children's autonomy, offering opportunities to choose what to do and how to do it without a teacher's interference. They also stress the importance of the teachers' interaction with children and teachers' understanding of childhood and of children as active participants in their own learning. In environmental education and in education for sustainable development, children's participation in environmental projects has been seen as important. These projects emphasise children's involvement in decisions relating to the environment and encourage children to act on their decisions about events they have experienced (Breiting, 2008). The outdoors can offer many opportunities for children's participation in society, where children could see themselves as actors of change and by that learn how decisions are made (Ardoin et al., 2013; Ärlemalm-Hagsér, 2013; Greenwood, 2013; Smith, 2011). In an Icelandic study, it appeared that compulsory school teachers found using the outdoors to be a beneficial way for children to participate in a democratic society and also to learn from other agents in the society (Óskarsdóttir, 2014). In recent years the emphasis in research regarding education for sustainable development in preschools has been more on educating children to act for change instead of teaching children facts about the environment (Hedefalk, Almqvist, & Östman, 2014).

Summarised, research findings tell us that teachers find children's experience, learning and participation of the outdoor environment

important in affecting children's views, attitudes and actions regarding the preservation of the environment.

2.3 Intended contribution of the research

In a literature review of research on outdoor learning, Rickinson et al. mention 'blind spots' in our knowledge about the current debates and developments in outdoor education and the importance of investigating them in relation to history and politics. The term 'blind spots' refers to issues that are not easy to identify. It can be because the method or theory does not allow the issues to be seen. They state: 'To support this, research is needed into the socio-historical development of outdoor education policy, discourse and practice' (Rickinson et al., 2004, pp. 56–57). The first article (Study 1) contributes to the knowledge of the discourse in policy documents concerning the role of the outdoor environment in children's learning. The historical and political dimensions of outdoor education in Iceland were considered through an analysis of laws, regulations and other policy documents.

Rickinson et al. (2004) also indicated that there are gaps in our knowledge about how teachers see the outdoor classroom, what aims are important to fulfil and what teaching strategies they see as effective in outdoor education. The second article (Study 2) builds on an investigation into teachers' ideas about why they choose to use the outdoor environment in their teaching, for what purposes, and how it is used, as well as the kind of environments they use and those they prefer to use in the school's neighbourhood. Thus, this study contributes to our knowledge about teachers' ideas concerning the use of the outdoor environment in children's learning.

As mentioned earlier, little research has been done on the outdoor environment and its role in children's learning in Iceland. Only two studies have been conducted regarding young children's learning and preferences for the outdoors (Einarsdóttir, 2005; Norðdahl, 2005) and one about the frequency of using field trips and outdoor learning in compulsory schools and teachers' views on the same topic (Óskarsdóttir, 2014). In addition, there are two studies on discourse about outdoor life in Iceland (Jóhannesson, 1994; 2001) and one study on mountain trips with compulsory-school children (Þorsteinsson, 2011).

Internationally, there are few research projects about the way children view the outdoor environment, but this is a growing research field (see, for example, Clark, 2007; Malone & Tranter, 2003; Titman, 1994; Waller, 2006;

2007). Much work is needed in order to improve our knowledge about the kinds of outdoor environments children in different age groups prefer and what activities they prefer to do outside. This is addressed in the third article (Study 3) that contributes to our knowledge of how children ages four to nine see their school environments, what they prefer, and what they want to do there. The methods used in Study 3 also provide new knowledge about how teachers as well as children can be an important source of data about children's ideas. In the school ground project in Study 3, the teachers' attention was focused on children's ideas, and they themselves were gathering data.

Study 4 also addresses the previously mentioned blank spots in the knowledge about how teachers see the use of the outdoors in regard to children's learning (Bentsen, Mygind & Randrup, 2009; Rickinson et al., 2004). In this study, the emphasis is on how teachers use the outdoor environment in their teaching. The study contributes to the knowledge about which teaching strategies teachers find effective and not so effective in outdoor education for young children. This study also contributes to the knowledge about young children's science education. Fler & Pramling (2014) argue that this is small research area, but it has grown over the past decade.

Furthermore, knowledge gained as a result of the entire research comprising four interconnected studies that consider the viewpoints of policy makers, teachers and children, as well as teachers' praxes in the outdoors, is used to draw a holistic picture of the role of the outdoor environment in children's learning. This approach to answering the research question is, to the best of my knowledge, one that has not been used before. This provides opportunities to compare different affordances of the outdoor environment for policy makers, teachers and children, and it can contribute to a better and more comprehensive understanding of the issue.

2.4 The research questions

The main research question is: What is the role of the outdoor environment in children's learning?

To answer it, the following questions have been investigated in different research projects:

1. What characterises the discourse on the role of the outdoor environment in children's learning in policy documents in Iceland? (Study 1).

Three other questions arose as follows:

- a. Whether, how and why the documents considered outdoor environment important?
 - b. What were the principles that legitimated main ideas in the documents?
 - c. What were the contradictions and tensions in the discourse?
2. How did teachers with experience in outdoor education and who participated in an education for sustainable development (ESD) project view the role of the outdoor environment in children's learning? (Study 2).
 3. What were children's preferences about outdoor activities and surroundings in the outdoor school environment? (Study 3).
 4. How did preschool teachers and compulsory school teachers, who participated in an action research project, use the outdoor environment in teaching young children about living beings and how did their ideas and practices change during the project? (Study 4).

As mentioned earlier, four studies were conducted to answer these questions, and together they form the PhD research project. The findings from each study have been published in three articles in academic journals, and one book chapter has been submitted for review in an international handbook on outdoor play and learning. The PhD thesis comprises these articles and the book chapter, with an introduction and discussion where the findings are discussed and theorised.

3 Research design

In this chapter, the research design is described and discussed. After an introduction to the research approach, an overview of its design and methods is presented. In addition, the ethical issues of the research are reflected upon. Finally, the strengths, limitations and quality of the research are discussed.

3.1 Introduction to the research approach

As previously noted, this research consists of four studies intended to conceptually and empirically investigate the role of outdoor environments in children's learning. In the four studies, my intention was to investigate this subject from different perspectives: first by looking at the discourse in policies on the subject from the government and several municipalities; by considering how teachers and children viewed the outdoors; and finally by investigating how teachers used the outdoor environment to teach children about living beings.

To accomplish this, several methods, mostly qualitative, were applied. For Study 1, I used historical discourse analysis, which builds on research approaches found in the fields of history and philosophy, sometimes called humanities-oriented research (AERA, 2009; Jóhannesson, 2010). Such research is difficult to categorise as qualitative or quantitative research, as it is, as Jóhannesson (2010, p. 251) argues, 'at once different from and similar to research described as qualitative or quantitative'. Other studies comprising the PhD research can be categorised as qualitative.

The word qualitative refers to the qualities of the issue studied and also to the processes and meanings involved in it. Qualitative research is characterised by the opportunities it offers to study a research problem from the perspectives of the people involved, as I did when studying the ideas of teachers and children regarding the learning possibilities afforded by the outdoor environment. Denzin and Lincoln (2011) define qualitative research as:

Qualitative research is a situated activity that locates the observer in the world. Qualitative research consists of a set of interpretive, material practices that make the world visible.

These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversation, photographs, recordings, and memos to the self. (p. 3)

In qualitative research, these representations are seen as practices that make the world visible in different ways. Qualitative researchers often use more than one practice or method to enrich the picture of the topic in question, as I did in my research.

3.2 Participants, settings and data gathering in each of the four studies

The gathering of research data started in the autumn of 2008 and was completed in the summer of 2011.

I conducted Study 1 on the discourse of Icelandic policy documents both nationally and from municipalities regarding the role of the outdoors in children's learning. Documents were gathered nationwide as well as in selected municipalities in Iceland from the winter of 2010 to the summer of 2011. This study was conducted in cooperation with the lead supervisor.

Three groups of documents were selected for inclusion in this study. The first group consisted of acts and regulations (six documents), and the second one consisted of the national curriculum guides for the preschool and compulsory school levels (14 documents). The third group consisted of local policy documents (school and education policies; Agenda 21; family, health and communications policies) from eight main regions of Iceland, including both small and large communities in the countryside and coastal areas (45 documents). I judged that together, these 65 documents would provide a representative picture of the policy regarding the outdoor environment, on both the national and local levels. The local documents represent municipalities where approximately 60% of the nation's population lives.

Data from Studies 2 and 3 are drawn from larger research and development projects. Studies 2 and 3 were conducted in relation to the research and development project *ActionESD (Educational action for sustainable development [I. Geta til sjálfbærni–menntun til aðgerða])* organised by a research group from the School of Education at the University of Iceland and the University of Akureyri (see more on ActionESD, n.d.). The aim of this project was to further the understanding of education for sustainable development and of what is needed to encourage

children's actions in that direction. Altogether, eight schools, four compulsory schools and four preschools, participated in the ActionESD project. Data were gathered in autumn and winter of 2008–2009 for Study 3 and in spring 2009 for Study 2.

The schools participating in the two school projects (Studies 3 and 4), the data were gathered in were located in two communities. On the one hand a municipality in the capital area I call the Lowland (Study 3) and on the other hand a district in Reykjavík I call the Hills (Study 4). Lowland is a old but small municipality of around 2000–3000 people, in a former agricultural district, where the population has grown quickly in the last three decades. The Hill is a newly built district the first houses were built after the turn of the millennium. In both communities in 2009 there were relatively many children or around 34% of the population in each of these communities was under 18 years of age, compared with Reykjavík in general where 24% are under 18 years of age (Hagstofa Íslands, n.d.a, n.d.b).

Both of these communities are in the outskirts of Reykjavík, close to natural areas and it takes only 5–10 minutes in each of them to walk to a popular outdoor life area. Both of these communities are peaceful areas; for instance, while crime rates are at average in the Hill, they are among the lowest in the capital area in the Lowland (Árnason, Heiðarsdóttir & Þórisdóttir, 2010)

In 2011 around 85% of the inhabitants in the Lowland lived in their own apartments (Hagstofa Íslands, 2015a) consisting in 2006 mostly of villas (75%) with gardens and small apartment buildings (20%) (Gunnarsson, 2006), but the real estate prices are lower than in Reykjavík. In the Hill 70% of the inhabitants live in their own apartments (Hagstofa Íslands, 2015b) mostly in apartments buildings and the average size of the apartments in the district is large or 122 m² (Umhverfis- og skipulagssvið Reykjavíkurborgar, n.d). In 2011 unemployment in both communities was low or less than 6%, just a little less than in Iceland in general, which was 6.2% (Hagstofa Íslands, 2015a, b). Thus, the economic status of the inhabitants in both communities is rather good.

Not many immigrants of foreign citizenship lived in these communities in 2011 or around 3% of the inhabitants in each of them, compared with 8.6% in the whole country. The inhabitants in both communities are rated as well educated; of people 25 years and older, in the Lowland just under 34% of inhabitants have a university education and around 38% of the

inhabitants in the Hill, compared with 29% of the whole population in Iceland (Hagstofa Íslands, 2015a, b).

In Study 2, a purposive sample (Lichtman, 2010) was used. Data were gathered by interviewing teachers in all of the eight schools participating in the ActionESD project in regard to their ideas about the role of the outdoor environment in children's education. All these schools used the outdoors in their curricula to varying degrees and thus provided a good sample for studying teachers' ideas about this topic. Both experiences of participating in ActionESD and of using the outdoor environment in their teaching made these teachers likely to be an 'information-rich' sample (Gall, Gall, & Borg, 2003, p. 165) that would be knowledgeable about the role of the outdoor environment in children's learning and in sustainability education. The questions considering the role of an outdoor environment made up only a small part of the more comprehensive interviews about the teachers' perspectives on and experiences of the ActionESD project.

Twenty-five teachers were selected to participate in the study from four compulsory schools and four preschools. These consisted of the principal or the director of each school along with a contact person with the ActionESD project group and one or two other teachers participating in the project (see also Pálsdóttir & Macdonald, 2010). These interviews were conducted in the spring of 2009 after a yearlong cooperation in the ActionESD project. The participants from the preschools included preschool teachers, one art teacher and one preschool student teacher. Most of the compulsory teachers taught young children (ages six to nine), but several taught older children in the middle (10–12 years of age) or secondary school level (13–15 years old). The age of the participating teachers ranged from 29–63 years old, and their teaching experience ranged from five to 32 years. The principals' and directors' average administrative experience was about seven and a half years.

The schools participating in this project are located in different areas of Iceland, and none were in the capital city of Reykjavík. Four are located in two municipalities in the capital city area outside of Reykjavík with populations of 8500 and 2500. One of the schools is in Northern Iceland in a town of around 17000. Two are on the Reykjanes Peninsula, one in a village of 2800 people and the other in a town of 14000 people. The eighth and the last school is located in a rural farming area in Southern Iceland.

In Study 3, data were collected in three of the ActionESD schools, one compulsory school and two preschools in a small municipality near the capital city of Reykjavík. These three schools are all located close together

in the central part of the municipality. These schools worked on a project involving children's participation in the design of a common school ground. In the project, the teachers listened carefully to the children's ideas and made field notes; they also collected children's drawings and other forms of expression representing their ideas. Thus, the teachers were knowledgeable on the children's ideas about the outdoors and were a good resource for gathering data about them.

Participants in the development project, and therefore also in the study, included 100 four- and five-year-olds from the two preschools and 189 six- to nine-year-olds from the compulsory school. Out of this group, 16 children were selected to participate in interviews about their views and preferences on the outdoor environment. The teachers, who selected the children, were asked to choose children with various interests and from different neighbourhoods. A balance in regard to age and gender was also ensured in the group. The teachers who worked with the children in this age range in the project were interviewed, as were the directors of the schools. Seven teachers were from preschools and 11 were from the compulsory school.

Study 4 was conducted as part of a project called *On the same path* (*Í Á sömu leið*) organised by the *Center for Research in Early Childhood Education* in the School of Education at the University of Iceland (see more at the Center for Research in Early Childhood Education, n.d.). The aims of this research and development project were to further collaborations between preschools and compulsory schools, increase flexibility in work with children and build bridges between these school levels. A total of six schools, three preschools and three compulsory schools participated in the whole project. One preschool and one compulsory school chose to use the outdoor environment to fulfil the aims of the research and create continuity in children's learning about living organisms. Data were gathered in autumn 2009, spring 2010 and autumn 2010.

In all, 10 five-year-olds from one preschool and 20 compulsory school children, age six, participated in Study 4. Three teachers from the preschool and two from the compulsory school participated. The schools are in the same neighbourhood of Reykjavík and have a wooded outdoor area within walking distance, which they used in the project about living beings. Data was gathered through participation observation and interviews with the teachers at the beginning and end of the project, as well as during regular meetings held with the teachers. These meetings were sometimes recorded, and sometimes notes were taken. Figure 2 presents an overview of the data in each study.

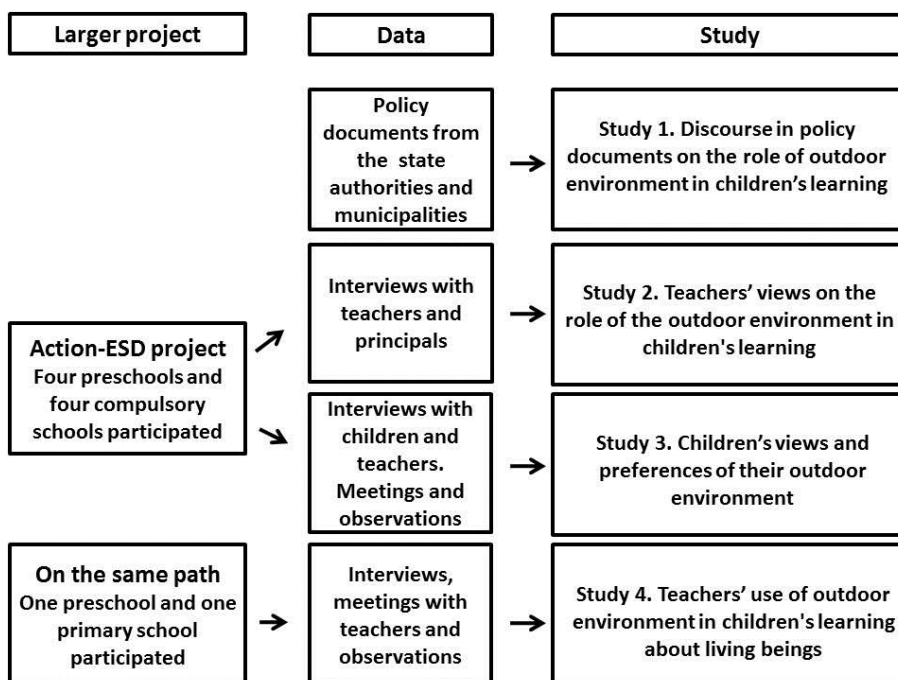


Figure 2 Overview of the data gathering process of each study

3.2.1 Interviews

In three of the four studies, I used interviews to gather data. These interviews were conducted with children and teachers. Interviews are an appropriate research method to gather information about how people describe in their own words their understandings and thoughts about the issue in question (Bogdan & Biklen, 2007). This helps the researcher to understand their points of view. All interviews included in the research were semi-structured or guided. In a guided interview, a general set of questions is used to lead the interview, but the interviewer can vary the questions according to what is appropriate in each situation (Greene & Hill, 2005; Lichtman, 2010). In semi-structured interviews, on the other hand, the participants have a greater opportunity to explain what they find important, and the role of the interviewer is to encourage participants to express their thoughts on the issues involved and to probe the participants for more information about these. This requires that the interviewer being familiar with the issues under discussion; he or she must also know when further clarification is needed or when to confirm his or her understanding of what the participant means (Savin-Baden & Major, 2013). In my research, I conducted most of the interviews myself, but in Study 2, two

other researchers led the interviews with me present in one third of the interviews.

Most of the interviews with the teachers were individual interviews, but in some cases, groups of teachers were interviewed. The group interviews were conducted, in one case, on the initiative of the teachers involved, and in the other cases, because of a lack of available time to conduct individual interviews. The duration of the interviews ranged from 40–130 minutes each. In both of the research projects, meetings with teachers were held regularly, and notes and records from these meetings were also used as data.

Interviewing children is in many ways different from interviewing adults. Conducting individual interviews with children can cause methodological dilemmas. Children may feel threatened and become frightened, especially if they do not know the interviewer (Einarsdóttir, 2007, 2011). Interviewing children individually can also increase the risk of the interviewer controlling the interview, which can result in the child saying what he or she thinks the interviewer wants to hear. Group interviews can counteract these negative effects but can cause other problems, such as difficulty controlling the direction of the discussion in the group (Nespor, 1997). Group interviews are advantageous in many respects, especially for young children, as they encourage interaction between children and give them confidence as discussion within a group is a familiar setting for them (Einarsdóttir, 2007, 2011). However, children can also be influenced by other children in the group. To decrease the negative effects of individual and group interviews and because I was interested in each child's ideas about the outdoor environment, I decided to interview the children in pairs to counteract the power imbalance between the researcher and the children (Alderson & Morrow, 2004; Einarsdóttir, 2007, 2011). The interviews took from 15 to 20 minutes, and after each interview the children led a walk on the school grounds. This provided further opportunities to discuss their ideas but in a different environment that often provided additional information (Clark, 2010; Clark & Moss, 2001).

3.2.2 Observations

I conducted observations in the two research and development projects in which Study 3 and Study 4 were conducted: One project dealt with children participating in the decisions about the design of a common playground or schoolyard. The other concerned how teachers used the outdoor environment when teaching about living beings in early childhood

education. Observation includes observing the activities of the individuals involved and the setting where those activities take place. As a researcher I tried to be as impartial as possible and at the same time realise the influence of my own interpretation of the observed activities (Angrosino & Rosenberg, 2011). While making the observations, I attempted to stay in the background; however, I often became involved in what was happening, although I tried not to take over the teacher's role. Thus, my observations can be classified mostly as participant observation (Lichtman, 2013), although the amount of participation varied. In the field notes, I recorded what I saw and later entered the handwritten notes into a computer, at which point I added details, which I still remembered but had not had the opportunity to record while in the field. In the outdoor education project (Study 4), I also used a digital Dictaphone to record teachers' interactions with the children. This data enriched the notes since the information was less coloured by my interpretation than the notes from my own observations and memory.

In the two studies where I used observations, Study 3 and Study 4, what was observed varied. In Study 3, where children participated in decisions about designing the schoolyard, I mainly gathered data about children's ideas about their outdoor environment and their preferences in that regard. In that study, many classes were involved. Thus I had to choose certain classes to observe, which I visited between one and four times, for a total of nine hours of observation. In this way, I gleaned information about the teachers' approaches to the school project and the diversity of children's ideas regarding their environment. I was able to add this to the data from the interviews. In Study 4, I concentrated on the teachers and how they used the outdoor environment to further children's interest in and learning about living beings. In that study, I made 20 observations, most of them lasted for one hour.

In both of the research and development projects I participated in and gathered data for, the ActionESD research and development project and On the same path, the teachers also gathered data such as diary notes, pictures and notes. These I also used as data.

3.3 Data analysis

The data gathered in relation to each study were analysed with regard to the research questions asked in each of them. I used mostly thematic analysis, but in Study 1 historical discourse analysis was used.

Historical discourse analysis is influenced by the theories of the French philosopher Foucault on the power of discourse. In Study 1, the discourse on the role of the outdoor environment in children's learning was investigated in policy documents in Iceland. This approach presumes that discourse can affect individuals, shape their opinions about issues and influence their decisions about what is considered good or acceptable to think and/or do (Foucault, 1979).

A six-step approach to discourse analysis (Jóhannesson, 2006, 2010; see also Sharp & Richardson, 2001) was employed. The first step was to identify the problem to be studied or, in this case, investigate what characterises the discourse on the role of the outdoor environment in children's learning in official policy documents in Iceland. The selection of representative documents for answering the research questions was the second step. The third step involved identifying the discursive themes in the documents. These discursive themes are ideas that can be identified repeatedly in the documents, as well as ideas that one would expect to find but are rarely or never mentioned (Foucault, 1979; Jóhannesson, 2006, 2010; Sharp & Richardson, 2001). Such silences are part of the discourse because they tell us what is considered legitimate and what is not and therefore kept quiet (Jóhannesson, 2006), as turned out to be the case in this discourse. A computer search was used to investigate whether or not words such as outdoor environment, outdoors, nature, neighbourhood, schoolyard, playground, outdoor education and outdoor play were used in the documents.

Then the policy documents were read and reread to identify how these terms were used and to decide which ideas were dominant or discursive themes in them. In addition, a count was made of the number of documents in which the terms were included. That made it possible to determine whether some themes were missing and others were mentioned in multiple documents, or if some themes were more common in certain types of documents than in others. The fourth step involved analysing the conflicts and tensions in the discourse.

The discursive themes form patterns in the discourse about what one is able or ought to say or not say if one wants to be listened to and taken seriously. These patterns are called 'legitimizing principles' (Bourdieu, 1988; Jóhannesson, 2010). The fifth step of the analysis determined the historical conjuncture of discourse, meaning that it investigated the effect of some ideas and practices gaining more legitimacy than others in the

discourse and asked why this is the case. In this research, a draft report was written as the sixth and final step.

In Studies 2, 3 and 4, thematic analysis was employed to analyse the data and was used under the influence of the key concept of the affordance of the outdoor environment. This was useful to investigate how teachers and children could see and actualize the functional opportunities the outdoors could offer them. I also used other concepts drawn from relevant theories to help me identify how the stakeholders saw and used the outdoor environment in children's learning. These include: place, experience, communication, culture and participation. Thus, we can characterise the analysis as a theory-driven thematic analysis.

Even though the analysis was theory-driven, I kept an open mind to be able to see what would emerge from the data. A six-step thematic research analysis method described by Braun and Clarke (2006) was used in this process in Studies 2–4. First, all the data from the interviews, meetings, teachers diaries, records from the observations and observation notes were transcribed. Second, the transcripts were read many times and coded according to the research questions in each study. In this step, the data were coded by hand. The third step was to identify potential themes from the codes; using a concept map was helpful in this process. The fourth step involved reviewing the themes to see whether they worked in relation to the coded text. The fifth step consisted of clearly defining the themes and giving them names, and the last step involved writing a draft report about the findings. The general procedure in the analysis was that I performed the initial analysis, then I discussed it with one of the supervisors and through that process the analysis often developed.

3.4 Ethical issues

As previously noted, the research was conducted in connection with two research and development projects in five preschools and five compulsory schools in Iceland. Because the schools participated using their real titles, it is impossible to conceal the names of the schools and difficult to completely conceal the identity of the teachers and children. In Study 2, only teachers and principals participated, and they were promised that their names would not be used, even though the schools could be recognised. In Studies 3 and 4, the research was introduced by letter to the local municipal authorities, the principals in the compulsory schools, the directors of the preschools and the parents of the children in these schools. The letter stated that participants in the research would be quoted only under a

pseudonym. The parents of the children were invited to inform me if they did not want their children to participate in the study. A representative from the local authority, compulsory school principals and preschool directors gave their informed consent in writing for the research to be conducted in the selected schools. Written informed consent was received from the parents of the children who were interviewed. The research was also reported to the Icelandic Data Protection Authority.

Although it is important to be aware of children's rights to decide whether or not they want to participate in research, it is nevertheless difficult to obtain informed consent from young children because they do not always easily understand what they are participating in and what consequences their participation may have for them (Dockett, Einarsdottir, & Perry, 2009; Harcourt & Conroy, 2005). Therefore, it is important to inform the children about the research and their participation in it in terms they can understand (Birbeck & Drummod, 2015; Dockett, Einarsdottir, & Perry, 2009). In the part of the research where I interviewed children in pairs, I asked them at the beginning of the interview if they wanted to participate in the research. I also explained to them that their identity would be hidden in any presentation of the research. It was also made clear to the children that they could leave the interview whenever they wanted. One four-year-old boy did not want to talk to me in the interview and left the study.

When children participate in research, it is particularly important to verify that neither the research nor the findings have the potential to harm them in any way (Alderson & Morrow, 2004; Savin-Baden & Major, 2013). The research questions in this study did not ask about any particularly sensitive information that could harm the children, neither in the interviews nor when the findings were published.

Before observations of the children in schools and in the outdoor environment took place, I told them what the research was about and asked if they had anything against my observing them while working on the project. I also told them that I would use pseudonyms instead of their real names in writing or in any other form of presentation of the findings. The children were all happy to participate, and some found it strange and even disappointing that I would not use their real names. Thus, in my intention to protect them, I did disappoint several of them. During the project, I also took some photos; they were not used as analysable data but were useful in helping me to remember situations more accurately. The children were

asked if they wanted their pictures taken; only one girl did not, and care was exercised to respect her wishes.

Dockett and Perry (2015) point out that children's participation in research has the potential to have positive impacts on their lives when the results of the findings are used to act in accordance with their voices. In Study 3, in which children's preferences and ideas about their outdoor environment were gathered, this was done in relation to a school project where the theme was how they wanted their school's outdoor environment to be. In this case, children's ideas were taken into account and used to construct part of the shared school grounds between the compulsory school and the preschool, an area previously used as a parking lot.

3.5 Limitations and strengths of the research

As noted in the introduction, I am an active participant in the discussion about the outdoors and outdoor education. Therefore, it is possible that I tended to become aware of aspects that supported my ideas rather than other points that did not. By realising this, however, and keeping this in mind in my interpretation and discussion of the findings, I hopefully minimised the impact of any such bias on the findings. On the other hand, because of my interest in this topic, I had sound knowledge about what might be considered a valid contribution to the research.

In the research, I was also a part of the situation I was investigating, as I was an advisor in two of the research and development projects involved. In Studies 2 and 3, data were gathered in schools that participated in a project about sustainability education called the ActionESD project, and I had been an advisor in three of them and present in the interviews with principals, directors and teachers in these schools. These three schools worked on a project where children participated in the decisions to be made about the design of common school grounds. These three schools participated in the ActionESD project because of my initiative, and the idea for the school grounds project was also mine. As an educator of teachers, several of the teachers were former students of mine. Thus, they may have been aware of my positive attitude towards using nature and the outdoors in school curricula, and this may have influenced their responses in regard to using the outdoor environment in this way.

In the school ground project (Study 3), the idea was that the school's outdoor space should become a 'green school ground', and I showed pictures of different kinds of 'green school grounds' in a presentation for the teachers in the compulsory school at the beginning of the project.

Several of the teachers showed these slides to the children with the intention of expanding their ideas about school grounds. This might have influenced the children in such a way that their ideas became more 'green' than they would have been otherwise. However, the intention was to familiarise the children with different kinds of environments, and the teachers did that in different ways. Several of them introduced outdoor sculptures to the children, and others introduced different kinds of environments by visiting different places and looking at different environments, both man-made and natural, found in pictures in magazines.

In this study, I conducted interviews with the children at the beginning of the project before the teachers had introduced them to any other kinds of environments. I also had a large amount of data about children's ideas that came forward in the project. I decided not to compare the ideas from the beginning and the end of the study. I think there is always something—the place we live in and places we have visited and seen—that influences our perspectives. The children received different impressions from the teachers in addition to having had different experiences of environments from the beginning, so it is difficult to differentiate what was influencing their ideas. However, by looking at all this data, I was able to form a picture of what these children liked and preferred in their environment during the period when they were working on the school ground project.

In the project about teachers using the outdoors, Gunnhildur Óskarsdóttir (a member of my doctoral committee and a co-author of the book chapter pertaining to Study 4) and I discussed with the teachers several issues they could address in their teaching. Thus some of the ideas they used with the children came from us, but how they proceeded was based on their own ideas. During the analysis, I kept this in mind and concentrated on how they implemented the ideas, how the children responded and how the teachers reacted to the children's responses.

3.6 Striving for quality—reflexivity and trustworthiness

The concept of validity is important in describing the quality of research. Validity is used to evaluate whether the research measures what it was intended to gauge and how truthful the research findings are (Savin-Baden & Major, 2013). This concept is drawn from a quantitative research tradition building on a positivist paradigm where reality is seen as a single identifiable and measurable factor. In qualitative research, reality is usually regarded not as one but as many. I see reality as something people create from their experiences and through their interactions with other members

of the society in which they live (Lichtman, 2013; Lincoln, Lynham, & Guba, 2011). Thus, in my view my role as a researcher is to gain an understanding of the reality of the participants in my research and to reflect on it. In that way, because they must participate in the research process, qualitative researchers acknowledge that it is impossible for them to separate themselves from the issues they are investigating (Lichtman, 2013).

The appropriateness of using validity in qualitative research has been debated for a long time. Researchers have redefined the concept in an attempt to describe how to obtain quality in qualitative research (Lichtman, 2013; Lincoln et al., 2011; Savin-Baden & Major, 2013). Lincoln et al. (2011) see qualitative research as being validated by its trustworthiness and authenticity. According to Savin-Baden & Major (2013), some researchers use the concept of trustworthiness instead of validity to describe the quality of their research. Among other aspects, trustworthiness involves how accurate the descriptions of events are and how well explanations are justified in the evidence presented. Lincoln et al. (2011) point out the importance of reflective writing for the quality of the research. Thus, in writing about the whole research process, I strived to be critical and reflective in regard to the decisions I made in designing the research, to the findings of the research and to the conclusions I drew from them.

To strengthen the validity or the trustworthiness of the research, some form of triangulation, or crystallization as some have redefined it (see, for example, Janesick, 2000), is recommended. Savin-Baden and Major (2013, p. 477) claim that triangulation can be seen as 'cross-examination at multiple points', such as using data from different times, spaces or persons, and also as the use of different investigators, various theories and various methods for collecting data or analysing it. In my research, I approached triangulation in numerous ways: I used various methods of collecting data in two of the studies where this was appropriate. When analysing the data, I first analysed it and then discussed it with my supervisors; in that way, more than one person was involved in the analysis. I also used concepts drawn from various theories to analyse the data. This process of triangulation not only confirmed the information gained but also provided additional information.

In the overall research project, I seek answers about the role of the school's outdoor environment in children's learning by investigating its role from the perspective of different agents influencing the issue: how the policy makers, teachers, and children view it, and how teachers use the outdoors. The concept of 'crystallization' (Janesick, 2000) may offer a better

explanation of how looking at the main research question from many different perspectives reveals different sides of the 'crystal'. Thus, each perspective offers a different reflection from the 'crystal', which in this case is the role of the outdoor environment in children's learning. The various reflected perspectives thereby offer a multidimensional and multifaceted understanding of the issue.

4 Findings

This PhD research was meant to be a critical investigation about different perspectives—those of policy makers, teachers and children—on the role of the outdoor environment in young children’s learning as well as a study of how teachers use the outdoor environment in promoting children’s learning. In order to accomplish this, four studies were conducted, each focusing on different ideas about or uses of the outdoors by policy makers, teachers and children. Here the main research question—what is the role of the outdoor environment in children’s learning?—is answered by describing the findings of the four studies. First, the findings from each of the studies are presented, and the main themes across the four studies are illustrated. Several gaps and surprises in the findings are also included in this section.

4.1 Summary of findings from Studies 1–4

The first article, ‘Children’s outdoor environment in Icelandic educational policy’, co-authored with my supervisor, Ingólfur Ásgeir Jóhannesson, was published in the *Scandinavian Journal of Educational Research* (see Norðdahl & Jóhannesson, 2015). It is based on analyses of policy documents, both countrywide, such as curricula, laws and regulations, and local policy documents from municipalities, with the intention of discovering how the role of the outdoor environment in children’s learning is discussed in these documents.

Legitimizing principles, contradictions, surprises and gaps in the discourse were identified. Three sets of ideas were identified as legitimating principles or dominant discourses. Legitimizing principles are patterns of direct or indirect rules created by the discursive themes about what one can and ought to say and also of what people should avoid saying if they want others to listen to them (Bourdieu, 1988; Jóhannesson, 2010). The first idea identified as a legitimating principle is the silence on or scant information about the outdoor environment, especially in the legislative documents concerning its role as a learning environment. This indicates that the outdoor surroundings do not have a high status as learning environments. The second legitimating principle in the policy documents regards children’s safety in the outdoors in the compulsory school law, specifically in four regulations on the operation of preschools and compulsory schools; this principle is also addressed in the municipalities’

policy documents. The third legitimating principle focuses on the outdoors, especially nature, as being beneficial for children. The reasons given for why the outdoors is considered good for children are that it benefits their learning, physical development and health and that it is a convenient space for children's play and for fostering children's positive environmental attitudes. Two types of contradictions were found: silence about the outdoors versus emphasis on it and discussions about risks versus learning opportunities.

We also looked for surprises and gaps in the discourse. In the policy documents from the municipalities, we found an interesting discursive theme we had not foreseen—the use of the outdoor environment to further people's love for their home district or their pride of their local environment and community. We also looked for topics that are part of the discussion on children's learning in general, such as democratic participation and gender issues, but found few or no references to these.

The second article, 'Let's go outside': Icelandic teachers' views of using the outdoors', co-authored with my supervisor, Ingólfur Ásgeir Jóhannesson, was published in *Education 3–13: International Journal of Primary, Elementary and Early Years Education* (see Norðdahl & Jóhannesson, 2014). This study's intention was to investigate how preschool and compulsory school teachers see the role of the outdoor environment in children's learning, and it is based on data from interviews with teachers. The outdoor places that teachers of both school levels most often mentioned using with satisfaction in their teaching were located outside of the schoolyard even if the preschool teachers took the children outside each day on the playground.

Three overarching themes appeared in this study. The teachers saw the outdoors as a place that provides opportunities for children's play and learning. In that context, they highlighted the importance of children's sensory experiences of various phenomena that cannot be found inside.

The second theme was about the outdoor environment's role in furthering children's health, well-being and courage. The compulsory school teachers stated that it is the role of the school to react against the fact that children are spending increasing amounts of time indoors. They also emphasised the health-improving effects of the outdoors such as clean air and opportunities for physical movement. The compulsory school teachers saw using the outdoors as a way to increase diversity in their teaching, and in that way they could address differing learning styles and the diversity of the children in their classes. It was interesting to see how the teachers in

this study viewed the potential risks of accidents that using the outdoors could involve. They seemed to think about this as a factor they had to take into consideration, but they did not see it as a hindrance in using the outdoors. These teachers valued the affordance of the outdoors for children to take on challenges and build self-confidence and courage. These benefits outweigh the teachers' fears of the possible dangers that taking the children outside could involve.

The third theme was that teachers in this study also saw the role of the outdoor environment as furthering children's views, knowledge and actions towards sustainability. These teachers were participating in a project about sustainability education (SE), and this background affected how they saw the outdoors used. The teachers mentioned that the outdoors helps create positive attitudes towards nature and also that the outdoor environment is well suited to learning about the position of humankind in nature, which could result in improved behaviours towards the natural world. The third way the teachers connected the use of the outdoors and SE involved children's participation in and positive impact on their environment and community.

The third article, 'Children's views and preferences regarding their outdoor environment', co-authored with my co-supervisor, Jóhanna Einarsdóttir, was published in the *Journal of Adventure Education & Outdoor Learning* (see Norðdahl & Einarsdóttir, 2015). This study's intention was to investigate the views and preferences of preschool and compulsory school children about their outdoor environment, and it is based on data from interviews with 16 children ages four to nine years old and interviews with 11 teachers as well as data from meetings with teachers and classroom observations.

The findings show that the children who participated in the study liked to be outside, that they highly valued the natural environment around them and appreciated diverse playground equipment in the outdoors. It was also obvious that they saw the playground and the schoolyard as part of the school. The children wanted to use their school's outdoor environment in numerous ways. They were interested in exploring various objects in the outdoors, such as living beings, water, sand, mud and sticks and discovering what they could do with them. The children wanted to use the affordance of the outdoors to challenge themselves, but at the same time they wanted the grown-ups to secure their safety in risky circumstances.

The children enjoyed communicating with other children and grown-ups, and they came up with ideas about how the outdoors could support

social interactions between children as well as children and grown-ups. The children also presented ideas that can be considered a critique of the idea of the school ground as a place only for children and teachers. Instead, they saw the school ground as a place for all people in the community to be together and to be in contact with other living beings. To make or find 'their own places' or 'nests' in the schoolyard or the playground was important for the children, indicating their willingness to be on their own or with a smaller group at least for some of the school day. Finally, the children mentioned that they liked fun things colours in vegetation and other beautiful objects in their outdoor environment.

The fourth article, 'Early childhood teachers' (pre- and compulsory school teachers) use of the outdoor environment in educating children about living beings', co-authored with my co-supervisor Jóhanna Einarsdóttir and the third member of my doctoral committee, Gunnhildur Óskarsdóttir, has been submitted as a chapter in *The SAGE Handbook of Outdoor Play and Learning*, (see Norðdahl, Einarsdóttir, & Óskarsdóttir, submitted). One article (Norðdahl & Óskarsdóttir, 2010) and two book chapters in Icelandic have also been published on this study (Norðdahl, 2013; Norðdahl & Eiðsdóttir, 2013). The intention of this study was to investigate how preschool and compulsory school teachers used the outdoor environment in children's learning about living beings and how did their ideas and practices change during the study. This action-research project was conducted in collaboration with specialists from the university. Five teachers participated in the research—three from the preschool and two from the compulsory school—along with 10 preschool children and 20 compulsory school children. The study is based on data from interviews with the teachers before and after the project and from regular meetings with them. It is also based on participant observations of the teachers working on the project and on their diaries from the project.

The findings showed that the teachers used the outdoor environment in multiple ways. They used it to further children's experiences of living beings by focusing children's attention on them. They used the experiences gained outdoors as a source of discussion. They also used the outdoors as a place for play and freedom, and the compulsory school teachers mentioned that this time was good for children who had difficulty sitting still for a long time; being outdoors meant they could move around without disturbing other children. The teachers used visual arts for further children's opportunities to investigate living beings, and to reflect on what they had seen and experienced in the outdoors. Study findings are presented in Table 2.

Table 2 Summary of the findings from each of the four studies

Study 1	Study 2	Study 3	Study 4
<p>Three legitimating principle were found:</p> <ul style="list-style-type: none"> • Silence on the outdoor environment as a learning environment • Safety concerns about the outdoors • The benefits of the outdoors for: <ul style="list-style-type: none"> ✓ Children's learning ✓ Play ✓ Exercise and healthy lifestyle ✓ Fostering children's positive attitudes towards the environment ✓ Furthering people's local pride <p>Contradictions found:</p> <ul style="list-style-type: none"> • Silence about the outdoors versus emphasis on it • Risks versus learning opportunities 	<p>Teachers saw the outdoors as a good place to:</p> <ul style="list-style-type: none"> • Provide experiences for children's play and learning • Increase physical health and well-being also to build courage and confidence • Further sustainability education 	<p>Children liked to be outside and they wanted to:</p> <ul style="list-style-type: none"> • Explore • Challenge themselves but also feel secure • Be in contact with others • Find or create nests • Enjoy beautiful objects <p>Physical exercise was a part of all above themes</p>	<p>The teachers used the outdoors as a:</p> <ul style="list-style-type: none"> • Source of experience • Basis for discussion • Place for play and children's freedom • As a content in children's creative work <p>Teachers' aim in using the outdoor environment was to further children's attitudes towards their environment by experiencing and learning about their environment</p>

4.2 Outlines of the main themes in the findings

Here I will identify the main themes from the findings of all studies comprising the PhD research. They are summarised under three headings and discussed further in chapter 5.

4.2.1 The status of the outdoor environment as a learning environment

Policy makers, teachers and children all see the outdoor environment as having a high status and as a beneficial learning environment that provides multiple opportunities for children's development and learning.

Policy makers see the outdoor environment as beneficial to children's learning, as evidenced in the national curriculum guidelines and the policy documents of the municipalities, but this is not evidence in the legislative documents, in Study 1. The teachers participating in Study 2 had already used the outdoor environment in children's learning, so it was not a surprise that they saw the outdoor environment as beneficial for children. In Study 4, several of the participating teachers had little experience using the outdoor environment for children's learning, yet these teachers also talked about the outdoors as being helpful and important in children's learning. The outdoor environment was highly valued by the children in Study 3. They liked to be outside and had diverse ideas about how the outdoors could be an environment for learning as well as for enjoyment.

4.2.2 The role of the outdoors

In revisiting the findings in the studies, four major themes about the role of the outdoors could be identified across the four studies. The role of the outdoor environment was seen and used as a place: (a) to further children's play and learning; (b) to promote children's physical and mental well-being; (c) for children's risk-taking and safety; and (d) to form children's views and attitudes towards the environment.

4.2.3 Surprises and gaps

There were several surprises and gaps in the findings. The most important surprise was the silence about the outdoor environment as a school-learning environment in the legislative documents, in comparison to its emphasis in curricula and local documents. Another surprise was the contradiction in how children's democratic participation was or was not related to the outdoors. In addition, the emphasis in municipalities' policy documents on local pride in connection to the outdoors was not foreseen.

There are also gaps in the findings. In particular, little connections were found in any of the data between the outdoor environment and gender and non between children's diverse backgrounds or multiple abilities and their respective uses of the outdoor environment.

5 Discussion

Here the overall findings of the research are discussed in light of previous research, and concepts drawn from the relevant theories constituting the background of the research.

5.1 The status of the outdoor environment as a school learning environment

The main finding of the research is that policy makers, teachers, and children perceived the outdoor environment as an important learning environment. In the policy documents there were conflicting views on this: whereas in the legislative documents the outdoors did not have a high status as a learning environment, in the curricula and policy documents from the municipalities, it did.

Teachers and children saw the outdoor environment as beneficial and providing multiple affordances for children's development and learning. These findings confirm earlier research findings regarding teachers' beliefs about the positive opportunities for children related to being outside (Björklid, 2005; Ernst & Tornabene, 2012; Fägerstam, 2013; Magntorn & Helldén, 2006; Moser & Martinsen, 2010; Szczepanski & Dahlgren, 2011). These findings are in harmony with previous research findings indicating that children like to be outside (Clark, 2007; Clark & Moss, 2005; Malone, 2006; Stephenson, 2003), and that outdoor areas are the most popular places in schools (Burke, 2005; Einarsdóttir, 2005, 2011).

Thus, these results support findings from other Nordic countries documenting that the outdoor environment is highly valued in children's lives and is seen as part of a good childhood (Bergnéhr, 2009; Garrick, 2009; Halldén, 2009; Nilsen, 2008; Waller et al., 2010), which suggest that this view is a socio-cultural construction (Rogoff, 2003). These positive views of the outdoor environment in children's learning are of interest, especially in light of the many scholars (for example, Bögeholz, 2006; Louv, 2010; Tranter & Malone, 2008) who worry that children have lost their relationships with the outdoors. In the next section I discuss why the outdoors had such a high status in the participants' views, why they value it, or, in other words, what they saw as the role of the outdoor environment.

5.2 The role of the outdoors

Four themes were found across the four studies. The role of the outdoor environment was seen and used as a place to further children's play and learning; as a place to promote children's physical and mental well-being; as a place for children's risk-taking and safety; and a place to form children's views and attitudes towards the environment.

5.2.1 The outdoor environment and children's play and learning

Play and learning were common themes in all four studies comprising the PhD research. They were seen as important in the national curriculum and in local policy documents in the municipalities (Study 1), but not in the legislative documents, which either did not mention the learning potential of the outdoors or only slightly noted this role. Rather the legislative documents addressed the outdoor environment more as a place for play. The teachers in Studies 2 and 4 referred to the role of the outdoors for children's play and learning and emphasised that the experience the outdoor environment offered was important for children's learning. This is in line with place-based theories (Smith, 2002) as well as Dewey's (1938/2000) theory of experience, in which children's experiences in the local environment serve as a basis of their learning. This is also consistent with previous research findings in various countries (Fägerstam, 2013; Kernan & Devine, 2010; Magntorn & Helldén, 2006; Óskarsdóttir, 2014; Szczepanski & Dahlgren, 2011) indicating that teachers value the experiences the outdoors offers for children's learning.

It was interesting that teachers at both school levels mostly identified places beyond the schoolyard and playground that they wanted to use in their teaching and planned outdoor activities with children. They seemed to see the schoolyard and the playground mainly as places for children's play and their own spontaneous enquiries and discoveries, thus as important places for children's learning. Few studies have been conducted in this area, but their findings are supported by the present study in how compulsory teachers see the school ground more as a place for children's play and social interaction (Paget & Åkerblom, 2003; Titman, 1994). This indicates that teachers do not use the outdoor environment that the children know best and have experienced most in their teaching. In this context it is worth considering Kyttä's (2002) findings about children benefiting most from outdoor environments they know well and also that natural environments offer more affordance than constructed environments. Most of the schools participating in my research were located in environments that offered

multiple outdoor opportunities for children's learning, and the teachers may have valued these more than the opportunities afforded by the school grounds. This is also in line with McInerney et al.'s (2011) argument that even if it is good to begin with the local, it is also good to use other more distant locations in children's learning.

The children in Study 3 expressed their preference for playing outside and mentioned wanting the outdoors to afford explorations of various living things and elements such as water, sand, mud, and wood. Even if the preschool children and compulsory school children's outdoor areas afforded them different experiences—with living things and other natural elements, for example—the differences in children's preferences by age were few in this regard. Nevertheless, the preschool's playgrounds afforded children a far richer environment in terms of possible experiences than the compulsory school children's schoolyard. In this sense, the concept of affordance can be useful in planning and designing children's outdoor experiences and environments because it focuses on the affordances of the outdoors for children's play and experience of different ages (Kernan, 2010). Kyttä's (2002) work on how social and cultural rules and practices influence children's use of the affordances of the outdoors are also relevant. Those involved in the construction of the playground and the school yard deem it more important for the youngest children to experience various things outdoors than children who have reached compulsory school. This result is furthermore congruent with previous findings that children want to explore and investigate outdoor environments in their play (Burke, 2005; Clark, 2007; Kernan, 2007; Malone & Tranter, 2003; Mårtensson, 2004; Titman, 1994; Waller, 2006).

Study 4 looked at how teachers used the outdoor environment to teach children about living beings and at how children's experiences and investigations of different organisms formed the foundation of children's learning. However, these teachers did not expect that children would learn only from their own experiences, as teachers in several other studies have done (Ejbye-Ernst, 2012; Fler, 2009). Such expectations have been criticised, using the argument that children cannot discover all knowledge on their own, especially not scientific concepts (Fler, 2009; Siraj-Blatchford & Siraj-Blatchford, 2002). The teachers in Study 4 placed a great deal of emphasis on the importance of discussing with the children their experiences outside. This aligns with Dewey's (1916/1966) theory about the importance of reflecting on experience and Vygotsky's (1978) theory about the importance of language and communication for learning and that learning takes place in a socio-cultural context (Fler, 2010; Rogoff, 2003).

As Scott et al., (2007) point out, scientific knowledge is created in a community of natural scientists, and children cannot obtain this knowledge from their own experiences without support from someone who has mastered this knowledge. Therefore, the quality of the discussions between children and their teachers about scientific concepts is seen as important in children's learning (Gustavsson & Pramling, 2014; Klaar & Öhman, 2014; Tulin, 2011).

Several interesting differences were noted in regard to how the preschool and compulsory school teachers presented scientific knowledge in the project about living beings (Study 4). On one hand, the preschool teachers liked to highlight knowledge the children themselves presented, or to use the outcome of an experiment or investigation that the outdoor environment offered to discuss a relevant scientific concept or explanation. On the other hand the compulsory school teacher, who was confident about using the outdoors in her teaching, often presented such knowledge herself. Here, these teachers could learn from each other because both of these approaches have educational value. The value of listening to children, supporting their enquiries, and discussing their hypotheses about subjects has been emphasised in young children's science learning (Fjörtoft, 2000; Harlen, 2006; Änggård, 2012). However, sometimes children will not come to a conclusion or find an answer to a question they have asked, and then it is the teacher's task to support their learning by explaining and answering their questions. Thus, these findings contribute to our knowledge about how teachers view and utilise the outdoors in children's learning and to our knowledge about young children's science education, an under-studied area (Cabe & Saçkes, 2012; Fleer & Pramling, 2014).

It was also interesting to see how the preschool teachers viewed children's free play and its role in children's learning. Although the teachers regarded free play as the children's main mode of learning, they did not always want to use it in goal-directed learning in the project about living beings in Study 4. This aligns with the contradictory ideas seen in other research findings about the role of the teacher in children's play, which see children's free play either as something the teacher should not interfere with or control or as an objective-driven learning process in which teachers can be involved (Einarsdóttir, 2010; Hreinsdóttir & Einarsdóttir, 2011; Ärlemalm-Hagsér, 2008). This has to do with teachers' roles in children's play, in supporting children's learning, and in using the learning opportunities that play offers (Pramling, Samuelsson, & Carlsson, 2008). Further consideration and investigation into how we can increase and enhance children's learning in areas such as science in play-based activities in outdoor settings would be worthwhile.

5.2.2 The outdoor environment and children's physical and mental well-being

The role of the outdoors as a place for promoting children's physical and mental well-being was a theme found across the four studies. This was a part of the discourse in the policy documents, both countrywide and in the policies of the municipalities in Study 1. This has also been evident in other discourse studies, such as Bergnéhr's (2009) study on discourse in articles on nature and childhood in a journal for preschool teachers in Sweden. The teachers in Studies 2 and 4 also mentioned the importance of the outdoors for children's physical exercise and health and some saw it as beneficial for children to be out in the fresh air. This confirms previous studies' findings that both preschool and compulsory school teachers from many countries see the outdoors as beneficial for children's health (Björklid, 2005; Davis, 2010; Ernst & Tornabene, 2012; Kernan & Devine, 2010; Szczepanski et al., 2006). In Study 3, it was obvious that the children wanted to move around, and children's preference for physical activities was involved in all the themes developed in the analysis. This also confirms what other studies have revealed about children's preferences for physical movement (Clark, 2007; Fjörtoft, 2004; Kernan, 2007; Niklasson & Sandberg, 2010; Waite, 2007). Implications of this are how the designs of school outdoor environments consider the affordances of the environment for children's multiple physical movements.

The importance of children's preferences for finding places where they can be alone or with only a few friends can be categorised here, as can their preferences for environments offering opportunities to communicate with other children. These have to do with children's mental well-being, and they are in line with findings from previous studies showing the importance of places for privacy and relaxation (Clark, 2007; Einarsdóttir, 2005; Fjörtoft, 2000; Kernan, 2007; Kylin, 2003; Titman, 1994; Waller, 2006; Änggård, 2012), as well as of places for communications with peers or grown-ups (Clark, 2007, 2010; Clark & Moss, 2005; Einarsdottir, 2011; Kernan, 2010; Kylin, 2003; Perry & Dockett, 2011; Titman, 1994). This could indicate that children's own place-making is important for them and should be taken into consideration in the design of children's school outdoor environments.

5.2.3 The outdoor environment and children's risk-taking and safety

The role of the environment as a place where children could challenge themselves and test what they could manage was apparent in the studies about teachers' (Study 2) and children's perceived or utilized affordance of

the outdoors (Study 3). In Study 4 this theme was not highlighted but teachers did not forbid children to challenge themselves and security issues seemed not to restrict children's freedom. However, in the policy discourse analysis (Study 1), a contradiction appeared in views of the outdoors: on the one hand, as potentially dangerous in laws and regulations and, on the other hand, as a useful learning environment in curricula and local policy documents. This contradiction was also found in the discourse analysis conducted by Kernan and Devine (2010). It was interesting to note how the teachers participating in this research study perceived the risk of children's accidents outside. They did not see it as an obstacle to taking children outside, but some mentioned this was something they had to take into consideration. This contradicts previous research findings from the USA, Ireland, and the UK in which practitioners' and parents' concerns about diverse dangers in the outdoor environment prevent them from taking children outside (Ernst & Tornabene, 2012; Kernan, 2010; Kernan & Devine, 2010; Rickinson et al., 2004). The teachers in the present studies found the educational potential of the challenges the outdoor environments afforded children outweighed the risk of accidents children might confront there. Some of these teachers saw the educational potentials of risks taken to be good for children because the experience teaches them to tackle the risks in the environment, avoid the dangers, seize opportunities to try out new things, and through that build up their courage.

The teachers' view agrees with how the children participating in this research saw the risk-taking. They regarded it as challenging and found it fun and enjoyable even if they sometimes were a bit scared. This corresponds with previous research finding that children enjoy the affordance of the outdoors for taking risks (Little & Eager, 2010; Sandseter, 2009; Stephenson, 2003; Titman, 1994). It was also interesting to note that when the preschool teachers in Study 3 began listening to the children's preferences of what they wanted to do outside, they reconsidered what was allowed or forbidden in the playground. The teachers realised that many things they had forbidden children to do before, such as climbing on the small houses in the playground, was not as dangerous as they had thought. By allowing this, the teachers offered the children opportunities to utilise the affordance of their outdoor environment more than they had before. This finding aligns with Kytä's (2002) remarks on how teachers and their practices and beliefs can either encourage children to use the affordances of the outdoors or restrict them from doing so.

Children's risk-taking seems to be more recognised and valued by teachers and other practitioners in the Nordic countries than in countries

such as the USA, the UK, and Australia (Ernst & Tornabene, 2012; Little et al., 2012; MacQuarrie et al., 2015; Sandseter, 2012; Waller et al., 2010). MacQuarrie et al. (2015) even refer to natural environments as offering risk-rich opportunities in discussing the different views of teachers in Nordic countries versus such countries as the UK. The reason for these differences may be the culture of outdoor life found in these different countries (Waller et al., 2010) as well as the low risk of lawsuits related to accidents resulting from being outdoors with children.

In this research, however, the compulsory school children in Study 3 also mentioned that they wanted the grown-ups to secure their safety in risky circumstances, such as playing in muddy ditches they could sink into. This aspect has seldom been mentioned in research findings addressing children's ideas on potential dangers in the environment. It contributes to our knowledge and raises an important point in the discussion about children's freedom to challenge themselves and take risks, but at the same time the grown-ups are responsible for ensuring children's safety in such circumstances.

The findings of this study indicate that in Iceland safety concerns do not dominated the debates on the educational value of the outdoors as seems to be the case in some other countries (Malone, 2007). This raises the question of whether some actions need to be taken to counteract this kind of discourse to prevent it from becoming established in Iceland and thereby reduce children's freedom, experience, and learning. This risk discourse has to do with whether we consider the scratches and bruises that children can get when playing outside as something dangerous for them, or if we view them simply as a normal part of getting to know the environment and how to handle living in it. This also has to do with how we view children, especially if we see them as competent and independent or as vulnerable and dependent (Kjörholt et al., 2005). The task is to find a balance between securing children's safety and giving them opportunities to learn from dangerous circumstances, to learn to handle them, and to build their confidence and courage.

5.2.4 The outdoor environment and children's attitudes towards the environment

The role of the outdoors as a place to form children's views and actions towards the environment was found in all four studies, but the emphasis varied. In Study 1, the national curriculum guides for both school levels refer to developing children's respect for nature and the environment,

teaching them to use it in a responsible manner, and fostering their willingness to protect nature. The municipality policy documents discussed the importance of children's opportunities to be outside and to have positive experiences in their surroundings, which would contribute to their respect for the environment, their interest in it, as well as their willingness to protect it. The municipalities' policy documents also referred to children's development of local pride. Pride in one's home municipality is seen as important for people's connection to a place, their choice of place to live, and their willingness to participate in protecting the social and natural environment (Avriel-Avni et al., 2010). Such pride seemed to have to do with creating a local identity and, in some municipalities, it was connected to employment in the tourism industry. This emphasis on the local can give multiple learning opportunities to children about the unique features of their local environment. This emphasis on forming children's attitudes towards the local environment can also be found in other discourse analyses, such as the one conducted by Bergnéhr (2009) on preschool teachers' journals.

The teachers in Study 2 also mentioned the importance of influencing children's views and attitudes towards the environment in a positive way. Some of these teachers even used the concept of outdoor education synonymously with sustainability education. The teachers in Study 4 stated that forming children's positive attitudes towards the outdoor environment was one of their main purposes in taking children outside. In analysing the data, I did not find any theme related to forming the attitudes of children towards the environment, but these teachers argued in the interviews that getting to know and enjoying their local outdoor environments are beneficial in forming children's positive attitudes towards the environment. Thus, as a large part of the data was about children's positive experiences in the outdoors and learning about their environments, this data can also be categorised as forming attitudes towards the environment. This is consistent with place-based theories that argue for connecting children with their local environment and society outside the classroom with the intention of making them conscious of them (see, for example Gruenewald & Smith, 2008). These findings about teachers' beliefs in the relationship between children's good experiences with nature, and their development of environmental awareness, and their subsequent willingness to protect nature confirm previous research findings on the subject (Ärlemalm-Hagsér, 2013; Fägerstam, 2012; Hill & Brown, 2014; Kernan & Devine, 2010; Szczepanski & Dahlgren, 2011).

The connection between enjoying the outdoors and respecting and wanting to take care of it was obviously not something the children themselves mentioned directly. However, I interpret their wish for the environment to afford them enjoyment in the same way that the teachers did. An example of the children's preferences in this regard was that they wanted the outdoors to be more colourful with more vegetation and a habitat for animals. Several also mentioned that they did not want to have trash on the playground. Their enjoyment of the outdoors can be seen as a good basis for an emotional connection to the environment, which is seen as the foundation for respecting and wanting to preserve it (Davis, 2010; Louv, 2010; White, 2004). Several studies have supported this relationship (Bögeholz, 2006; Chawla, 1999; Wells & Lekies, 2006). However, Rickinson et al. (2004) argue that research findings have not confirmed this connection and such respect and action are not something that happens automatically. Gurholt (2014) sees the positive experience of nature as an important foundation but as one needing a combination of cultural, political, and environmental processes to become part of people's attitudes and actions. It is obvious that this belief regarding the relationship between experiencing the outdoors and wanting to preserve it is fundamental. It did not come as a surprise to hear these views voiced since their sentiments are already found in the literature (see above). This is also an area that would be interesting to investigate further.

The teachers in Study 2 had been participating in a sustainability education project and had further ideas about how the outdoor environment positively affects children's attitudes and actions towards the environment. As is known in the literature, they believed that knowledge about the place of humankind in nature can be helpful in improving people's behaviours in the natural world (Ärlemalm-Hagsér, 2013; Davis, 2010; Fägerstam, 2012; Szczepanski & Dahlgren, 2011).

The teachers in Study 2 also discussed children's participation in several projects within their community and the opportunities to be involved in decisions made about the outdoor environment that were offered to them, thus contributing to their real experience of their democratic rights. These findings are consistent with the recommendations of both place-based education (see, for example, Greenwood, 2013) and sustainability education (Ardoin et al., 2013; Ärlemalm-Hagsér, 2013) on the opportunities offered by the outdoors for children's participation in society, who can thereby conceive themselves as actors of change and learn how decisions are made. The present study also supports previous findings (Smith, 2011) about outdoor opportunities for children's participation and

the study offer several useful examples from which others can learn. This findings make an important contribution to our knowledge about young children's sustainability education, as research in this area is scarce, especially research that approaches young children as agents of change (Davis, 2009).

5.3 Surprises and gaps

5.3.1 Surprises in the research findings

As noted before, the contradictions between the emphases on the outdoor environment as a learning environment in the policy documents, such as the national curriculum guidelines and local policy, and the absence of this discourse in legislative documents was a surprise to me. The laws carefully define the school buildings, but do not deal with the outdoor environment in the same way. In Iceland, it is traditionally viewed as good for children to be outside, so it is peculiar that the laws do not reflect this. As an example, the Preschool Act (no. 90/2008) does not mention the outdoors, despite the long tradition of children playing outside for one or two hours daily at this school level. Another example is that the reference to the size of preschool playgrounds that had been in the regulation since 1977 was removed in its latest version (Regulation on preschool operational environment, No. 655/2009, Article 5). Instead it states that preschools should provide the minimum necessary facilities. This could result in a temptation for municipalities to save expenses by reducing the preschool outdoor area and by extension reduce children's experience of the outdoors and the educational opportunities it offers.

Another surprise was the contradictive views regarding children's democratic participation in the outdoors in the official policy documents in Study 1 and of the teachers in Study 2. The Acts and the National Curriculum documents emphasise childrens democratic participation but do not mention that the outdoors can be a good place to foster the competence for exercising these rights. This can be a sign that the affordance of the outdoors as a learning environment in this area is not recognised by policy makers. On the contrary the teachers found the outdoor very useful for children's practice of their democratic rights in their local community and some even saw this as impossible to accomplish inside. The teachers' views are in line with the literature where the outdoors is seen as valuable in children's participation in their community

in finding solutions to problems they may face both socially and environmentally (McInerney et al., 2011).

Furthermore, the before-mentioned emphasis in municipalities' policy documents to use the outdoor environment to further their inhabitants' local pride was surprising. This local pride appears in the documents as references to the uniqueness of the nature and sometimes history of the municipalities in which the inhabitant's should take pride. This idea can also be used in school context regarding the school grounds. Kernan (2010) points out that the literature about what affects children's feeling of belonging to a group or a municipality mostly focus on social interaction and contact between people. She wants to expand the discussion on what affects children's belonging to a group or a municipality to involve the physical environment as well as the social and cultural ones (Kernan, 2010). She points out in this respect that when the indoor environment for children is planned, care is taken to ensure that all children can find themselves at home. Kernan (2010) advises that we also look critically at the outdoor areas and what children are allowed to do there, as these areas can affect children's identity and relationship with the environment.

5.3.2 Gaps in the discourse about outdoor learning

When identifying gaps in the findings, I paid especial attention to issues that appear in discussions of children's education in general, such as gender, social background, disability, and multicultural issues. In the entirety of the research material, there was almost nothing about gender; the only mention of gender is found in Study 2. This was when a teacher talked about a group of boys who were acting problematically indoors but grew interested in the activities offered in the outside environment. This teacher mentioned that these boys needed different activities from the girls.

In Study 3, about children's views of their outdoor environment, I did not see any gender differences in behaviour and attitudes apart from their clothing: girls wore pink and boys dressed in brown and blue. In Study 4, I did not notice the teachers treating girls and boys differently, nor did I see gender differences in the children's actions. This may indicate that the outdoors is seen as a gender-neutral place. Neither the discourse analyses of Kernan and Devine (2010) nor those of Bergnér (2009) mention gender in connection with the outdoors.

The absence of gender and gender theory in my research preparation may have precluded me from recognising any differences by gender in the

study. Other research findings suggest that the outdoor environment is not a gender-neutral place for children (Paechter & Clark, 2007; Stordal, 2009; Thorne, 1993; Ärlemalm-Hagsér, 2010) or their teachers (Emilsen & Koch, 2010).

Other issues that are seen as an important part of the discourse on children's learning in general were hardly or not at all identified in relation to the outdoors in this research. These include issues like the children's social background and their ability or disability. However, the new regulation on preschool operation (Regulation on preschool operational environment, No. 655/2009) states that preschools should have playgrounds to provide children with multiple play and learning opportunities and to provide for children of diverse age groups and their diverse needs, including those of children with disabilities. The teachers in Studies 2 and 4 did not address any of these issues, nor did they address issues about the backgrounds of the children (such as, race, social background, ethnicity, and religion); neither did the children in Study 3.

These gaps in the discussion on the role of the outdoor environment in children's learning are in accordance with Nespor's (2008) criticism of place-based education's failure to address issues like where children come from and their multiple abilities, which are considered important in the general discussion of children's learning. Thus, the criticism of place-based education seems to apply to outdoor learning and teaching as well (Nespor, 2008). These gaps in the findings indicate that the discourse concerning the role of the outdoor environment in children's learning in Iceland is rather new and does not yet address all aspects related to children's learning in general.

5.4 Reflections on the research process

As previously noted, I have been participating in the discussions and practice of using the outdoors in children's learning as a biologist and teacher educator. From the beginning the research had three overall purposes. The first was to increase understanding of the role of outdoor environments in the school curriculum and in children's lives in general. The research has helped me to understand this better by looking at it from different perspectives and by questioning practices and ideas that I had taken for granted before, such as that the outdoors is good for children. Yet at the same time it has made me more conscious of the value of the various aspects of children's outdoor experiences. The research has resulted in more emphasis on outdoor children's learning in my education of teachers

as well as in presentations at professional and research conferences. I have also written about one of the studies (Study 4) in Icelandic in an attempt to further teachers' discussions about whether the outdoor environment is important in children's learning, why, and how is it best used (Norðdahl, 2013; Norðdahl & Eiðsdóttir, 2013; Norðdahl & Óskarsdóttir, 2010).

The second purpose of the research was to contribute to teachers' discussions about the status of the outdoor environment in the school curriculum and practice. For that purpose, among other things, I wanted to hear and explore the perspectives of teachers who had experience using the outdoors in their teaching. Yet at the same time I did not want participants who were considered specialists in the area because I wanted other teachers to have the opportunity to identify themselves with these teachers. I have also tried to emphasise in my teaching the role and authority teachers have regarding if and how children have the opportunity to experience the outdoors. I believe these research findings show that teachers can enrich children's lives by enhancing and multiplying their learning environments both inside and outside. However, they can also restrict children's access to the outdoors, making experiences of the outdoors limited and unusual events in the children's lives.

In my teaching I have also addressed the risk discourse regarding children and the outdoors. I am, like many others, concerned about children's safety in the outdoors as well as in other places, but I am also concerned that those in charge of children do not adopt extreme measures to secure children's safety out-of-doors. Getting to know the fear discourse related to children's outdoor play and learning in some countries has made me eager to counteract such discourse in Iceland. I have put forward such views to my students and to colleagues in conferences.

The third purpose of the research was meant to be a contribution to landscape designers' and other decisions-makers' discussions of the role of schoolyards and preschool playgrounds in children's learning. The findings from Study 3 indicate that children are capable of coming up with many good ideas about how to construct their school's outdoor environments in order to make it conducive to play and learning. I have also presented these findings with the intention that they may eventually affect landscape designers and not least of all that teachers might involve children in the design process of the environment. This could be seen in Clarke's (2007) research project on involving young children as well as practitioners in the design process of their outdoor environment.

In the process of conducting this research I have learned many things that were neither defined in the original purposes nor necessarily addressed in the articles or in the book chapter that are part of the thesis. One thing I learned was how important it is to use the opportunities offered by a project like the school ground project in Study 3 to promote children's participation in decision-making and involvement in their local community. Even if this research did not focus primarily on the possible effects of such participation on children, there are some examples in the data referring to how children experienced it. The children were told that the architect could not use all the ideas they came up with in designing the school ground. Nevertheless the children realised that they might have an effect on the design of the ground. In one of my observations, a group of seven-year-old children worked on a model of their school ground, and I was not sure what it demonstrated. I told them they had to be careful to mark their ideas and make them clear so that the architect would understand their suggestion. Then one seven-year-old girl said with emphasis: 'This is a very important day'. So at least some of them did understand that they could have a real influence on what kind of affordance their school ground could offer.

This research has taken me eight years and has taken many turns. The research process involved among other things a struggle with the meanings of certain concepts and then decisions about which ones would be most appropriate to use. The research involved investigating the different perspectives of three stakeholders on how they saw the role of outdoor environments in children's learning. I found the concept 'role' useful in investigating how the different stakeholders regarded the status of the outdoor environment as well as why they viewed it as they did. I used this word, 'role', to include multiple possibilities. Thus, the meaning is the same as in the plural version of the concept, 'roles'.

Also it was not easy to decide whether to use the concept of 'learning' or 'education' in the outdoors. I chose to use the concept learning, but I use it in a broad sense not far from how I would have used the term education. The reason behind this choice is that I discuss theories and research findings regarding children's learning in the background chapter, but I only briefly address what education might be. The concept of learning, as I use it in a broad sense, includes the construction of knowledge, skills, views, and the willingness to act. The concept of education in my mind is a broader concept referring to long-term changes in a person, changes that are beyond learning—education in that sense can be seen as the sum of what a person has learned. Or as the Icelandic philosopher Skúlason (1987) states, education is the thing that makes a human a human.

Selecting what theories to use in the research was also a struggle. As I was investigating how policy makers, teachers, and children view the role of the outdoors and how teachers use it, I expected them to express multiple perspectives. As a result of this, I employed many different concepts that helped me to see different perspectives in the data. It might have been easier to use just one or at least fewer concepts and theories. Yet at the same time this has raised my awareness of the multiple opportunities for children's learning that policy makers and teachers see the outdoor environment providing. Using these various concepts has helped me recognise these multiple opportunities, and, in that way, these theories have strengthened the research.

The methods used in investigating children's ideas and preferences about their outdoor environment provide a new knowledge of how teachers as well as children can be an important data source about children's ideas. As most researchers do I used interviews to gather data about children's ideas. As the children were working with their teachers on a project about their school grounds the teachers learned about children's ideas and preferences. This allowed me to get further information on children's ideas by interviewing the teachers and often they confirmed what the children themselves had mentioned.

The research design of conducting four different studies made the research quite expansive, but at the same time I was trying to investigate each perspective in depth. Some of these studies I would like to follow up in more detail, such as why teachers who use the outdoors act and think as they do and why children think about and use the outdoor environment as they do. Including the views of children's parents in future studies would add value to the research area. Nevertheless, I believe that the overall findings of the research regarding the role of the outdoors in children's learning, the contradictions in the various discourses on it, as well as the gaps found in the discussion provide an important message to the community of policy makers, researchers, and teachers involved in children's learning. This message, I hope, can be used for the benefit of children in the future.

6 Final words

In this final chapter, I discuss five main suggestions that I derive from this work. These suggestions are directed to policy makers, researchers, and practitioners in schools.

First, the findings of this research indicate that in Iceland the outdoor environment is highly valued in children's lives. The policy makers, teachers and children considered the outdoor environment good and as beneficial and providing multiple opportunities for children's learning and development. In this context, however, the laws and regulations need to be better laid out to support documents derived from them. The outdoor environment is not mentioned at all in the Preschool Act and in the Compulsory School Act it is not discussed in the same manner as the school building. The removal of references to the size of preschool playgrounds in preschools, can also be interpreted as sending the message that these places are not important for children. All this can be seen as indicating that legislators do not see the outdoor environment as an important learning environment. It can give municipalities opportunities to reduce these areas from what they are now, or in future planning, and by that minimise children's educational opportunities.

Second, the findings in this research revealed that outdoor places offer experience the classroom hardly offers. The finding also tells us that the place for the teaching matters. Teachers found it good to discuss the living beings and divers' things in relation to them in the place where they could encounter these things. The experiences from the outdoors can also be reflected upon in the classrooms and other places indoors and thereby the outdoors offers a contribution to the learning that takes place inside the school building. The research indicates that many outdoor places offer opportunities for children's physical movements that children enjoy and are beneficial for their physical and mental wellbeing. This offers an opportunity to combine physical movements, play, freedom and learning experiences. This can also be seen as beneficial to the learning of diverse group of children, by contributing to a greater diversity in teaching.

Third, the findings also provide examples of how the outdoors offered multiple opportunities for children to gain experience and knowledge of their outdoor environment and community and by that forming their

positive attitudes towards their local environment. Also the findings in this research indicate that using the outdoors gave children experience of using their democratic rights by participating in decision-making in their community. Thus, the importance of using the outdoors in children's democracy education and education for sustainability may have implications in school curricula. The official policy, in laws and national curriculum guidelines would also benefit from connecting the references of democracy to the outdoors.

Fourth, the findings of this research regarding children's risk and safety outdoors are interesting. In policy documents and among teachers the discourse of fear and safety aspects has not dominated the discourse on educational value of the outdoors. The participating children liked to take challenges and find out if they could manage them but some of the children also expressed that they wanted to be under the guidance of adults in risky situations. This is something practitioners need to consider, and keep in mind that not all children are the same and therefore listen to individual children and give each of them opportunities to challenge themselves and learn from it is of importance. In these situations it is important that adults support and protect children until they have realised the danger the situation involves and how to take care of them self. Thus, the findings may have implications for the whole society, to consider the discourse of fear for children's safety outdoors—a discourse that has in many countries resulted in children's lost educational opportunities the outdoors can offer them.

Fifth, these findings also indicate that children's preferences of their outdoor environment and what they wanted to do outside, can be of use in decision-making regarding designing of school outdoor areas. School grounds should be constructed for the ones that use them, therefore the children who are the ones that use these places most should be involved in the decisions of what kind of opportunities the school grounds should offer. Diversity of landscape, plants and animals as well as diverse play equipment and play and place making opportunities were among the things the participating children mentioned in this research. This is not the picture that most school grounds especially compulsory school grounds show, where flat surfaces and fields for ball games dominate the outdoors that are supposed to appeal to all children. Thus, teachers and landscape designers could improve schoolyards and playgrounds by listening to children ideas and preferences of the outdoors, and what they want the outdoors to offer them to do. Also the process of getting children involved in such decisions can offer diverse learning opportunities and empowerment of the children.

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The articles in the PhD thesis

Article 1

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Article 2

Norðdahl, K. & Jóhannesson, I. Á. (2014). 'Let's go outside': Icelandic teachers' views of using the outdoors. *Education 3–13: International Journal of Primary, Elementary and Early Years Education*. doi:10.1080/03004279.2014.961946

Article 3

Norðdahl, K., & Einarsdóttir, J. (2015). Children's views and preferences regarding their outdoor environment. *Journal of Adventure Education & Outdoor Learning*, 15(2), 152–167. doi:10.1080/14729679.2014.896746

Article 4

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Article 1

Children's outdoor environment in Icelandic educational policy

Children's Outdoor Environment in Icelandic Educational Policy

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The aim of this study is to investigate what characterizes the discourse on the role of the outdoor environment in young children's learning in educational policy documents in Iceland. Policy documents, laws and regulations, national curriculum guides for pre- and compulsory school levels, and documents from municipalities were analyzed. A six-step approach to discourse analysis was utilized. The main findings are that the outdoor environment is not highlighted in these documents, but is rather seen as a benefit to children's learning, health, and play and the fostering of children's positive environmental attitudes. Two types of contradictions were found: Silence about the outdoors versus emphasis on it, and discussion on risk versus learning opportunities.

Keywords: outdoor environment, discourse, children's learning, educational policy

Introduction and Background

In this article, the intention is to investigate what characterizes discourse on the role of the outdoor environment in young children's learning in Icelandic policy documents. We believe that policy documents reveal which ideas are recurrent in the educational discourse. They may also contain new ideas which the authorities want to stress—in this case, regarding the role of the outdoor environment.

In Nordic countries there is a culture of seeing children's outdoor play, especially in nature, as part of a good childhood (Bergnéhr, 2009; Garrick, 2009; Halldén, 2009a; Nilsen, 2008; Waller, Sandseter, Wyver, Årlemalm-Hagsér & Maynard, 2010). An example of this is a Swedish study on elderly people's memories about places they liked in their childhood. Nature played an important role in people's stories, and its function as a children's play environment was taken for granted (Halldén, 2009b). The emphasis on the beneficial impact of nature in children's education can also be seen in the growing number of nature preschools in the Nordic countries (Borg, Kristiansen, & Backe-Hansen, 2008).

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Bergnéhr (2009) has studied how nature and outdoor play is discussed in relation to preschool, children, and childhood in a journal for preschool teachers in Sweden. She found that in many of the journal articles, nature is seen as positive in children's lives. She also points out that there are not many articles about this issue in comparison with those concerning other matters relating to early childhood education.

Seeing nature as important and good for children is also common in Iceland. Concerns that children's opportunities to play outdoors had decreased because people were moving from rural to urban areas were addressed as early as the middle of the twentieth century. It was commonly considered good for children to work on the farms in summer and have some time away from the "countless vices of the city life," in Garðarsdóttir's (2009, p. 177) description of the reasoning behind such a practice. The same idea was put forward by the headmaster of the Preschool Teacher Training College in Iceland, who argued that the outdoors in Reykjavík—the only city in Iceland, with about 56,000 inhabitants at the time of writing (Statistics Iceland, n.d.)—was not safe for children because of the growing volume of traffic and lack of space to play (Sigurðardóttir, 1952).

Risk and safety are prevalent parts of the discourse. Kernan and Devine (2010) found contrasting views on safety in the outdoors. On the one hand, the outdoors was viewed as a dangerous environment for children; on the other, it was seen as an "important resource to be exploited in the pedagogical relationship between adults and children" (p. 379). Some of their interviewees mentioned that safety regulations and the potential threat of lawsuits in case of accidents made it difficult for teachers to take children outdoors. Others referred to the importance of the outdoors for children in learning about and managing risk as part of their play. In her literature review about risk and play, Gleave (2008) argues that despite various efforts to minimize risk, the public's fear of hazard and danger has in fact increased. She claims that fear of risk is a social construct rather than being based on facts and that the media play an important role in this construct. This has caused parents to become overprotective of their children, resulting, as Malone (2007, p. 513) phrases it, in a bubble-wrap generation which parents want so much to protect that the children are deprived of opportunities to be "competent and independent environment users". How teachers and parents inform children about risks in the outdoors is influenced by each society's culture, according to Waller et al. (2010), who claim that in Scandinavia, preschool teachers' concerns about children taking risks in the outdoors are much less pronounced than in many other countries, for example Australia and the USA.

The outdoors and children are, in many people's minds, connected with health and well-being. Kernan and Devine (2010) found that the outdoors was seen as a space of freedom, and this was connected to its importance for children's physical health and well-being. This involves children moving freely outdoors, playing, and having fun, and is also seen as good for children's appetite, sleeping patterns, and resistance to illness, as well as reducing the risk of obesity. This was also one of Bergnéhr's (2009) findings from her analysis of articles on nature and childhood; that nature and outdoor play were connected to children's good health and well-being, both physically and mentally, as well as stimulating creative play and social development. Furthermore, Kernan and Devine (2010) observed the belief that the outdoor environment stimulates children's social development.

Kernan and Devine (2010) found that the outdoors was seen as a space of discovery and of sensual experience of natural phenomena, where children could explore nature and enjoy sensory experiences of plants and animals. Bergnéhr (2009) also found that the outdoor environment was seen as stimulating children's learning by awakening their curiosity and

interest. Children's sensual experience of nature was considered as something they take with them into adulthood, fostering their willingness to protect nature. Two Icelandic studies on discourse in policy documents about education for sustainable development found that these documents expressed the idea that the outdoor environment is helpful in this context (Jóhannesson, 2007; Jóhannesson, Norðdahl, Óskarsdóttir, Pálsdóttir & Pétursdóttir, 2011).

Children's participation and democratic education is also part of the discourse on the outdoor environment. In environmental education, and later in education for sustainable development, children's participation in projects on the environment has played an important role. These projects emphasize children's involvement in decisions relating to the environment, as well as encouraging the children to act on their decisions about aspects and events they have experienced (Breiting, 2008).

The concept of the importance of people's different degrees of attachment to a place has appeared in recent years (Avriel-Avni, Spektor-Levy, Zion, & Levi, 2010; Gruenewald, 2003). This sense of attachment to a place is seen as a key factor in people's choice of places to live and in their willingness to participate as citizens in protecting the quality of the social and natural environment. This can also be connected to the idea of the "robust child" constructed in the nature schools of Norway, where it is related to the practices which children participate in and are expected to manage in these schools, such as rough physical play, solving problems, keeping themselves warm in the cold weather, and being rational and independent children. The concept has been noted by Nilsen (2008), who links it to the national identity of the Norwegians, in which independence, love of nature, and outdoor play has an important role.

How nature can affect children's gender identities is a relatively recent aspect of the discourse about the outdoor environment. Stordal (2009) found that familiarity with nature, and acquiring useful skills in relation to it, was important for rural boys in Norway to be socially accepted as boys or men. Playgrounds in primary schools have been found to construct and maintain gender differences among both girls and boys (Paechter & Clark, 2007; Thorne, 1993). Årlemalm-Hagsér (2010) found that teachers recognized play, such as bicycling and ball-games, as something special to boys, while they thought it appropriate for the youngest children and older girls to play in the sandpits. There were hidden cues in everyday practices arranged by the teachers, and the children sometimes resisted these gender-stereotyped affordances. Emilsen and Koch (2010) found that men felt more freedom in working with children, in their own way, in the outdoors. They conclude that enhancing the outdoors in early childhood education could strengthen men's interest in the sector, where they are not restricted by "women's traditions."

This research contributes to knowledge regarding how policy makers and others who influence teachers discussion about the role of the outdoor environment in children's learning, and may help us to understand why they do so. Rickinson et al. (2004) state that this kind of research is lacking and recommend investigation of the "socio-historical development of outdoor education policy and discourse" (pp. 56–57). The findings can be used in forming official policy regarding the role of the outdoor environment, rendering it clearer and more effective.

In this study, we investigate how the role of the outdoor environment is discussed in Icelandic policy documents. The main question is: *What characterizes the discourse on the role of the outdoor environment in children's learning in policy documents in Iceland?* There are three other questions that arose:

- (1) Whether, how and why the documents consider outdoor environment important?
- (2) What are the principles that legitimate main ideas in the documents?
- (3) What are the contradictions and tensions in the discourse?

Method

The study is based on the approach of historical discourse analysis. This kind of research builds on research traditions from history and philosophy, sometimes named humanities-oriented research (AERA, 2009; Jóhannesson, 2010). Humanities-oriented research in education seeks answers to questions about how and why education is as it is, such as: What is its purpose? Whose interests does it serve? What consequences will it have? (AERA, 2009). Such research often deals with values—political, ethical, or esthetic—and frequently involves recommendations for improvements, but can also involve clarification of certain processes or phenomena by describing them in insightful and sometimes challenging ways, without passing judgment on them (AERA, 2009 p. 482).

A six-step approach to analyzing discourse (Jóhannesson, 2006, 2010; see also Sharp & Richardson, 2001) was utilized. This approach is influenced by the theories of the French philosopher Foucault on the power of discourse, which deal with the ways in which discourse can affect individuals, shape their opinions of things and define what is seen as good or normal to think or do (Foucault, 1979).

The first step in the analysis was to identify the issue to be studied. The issue at hand was finding out what characterizes the discourse on the role of the outdoor environment in children's learning in official education policy documents in Iceland at the beginning of the second decade of the twenty-first century.

Selection of Documents

The second step was to determine which materials were representative for answering the research questions. We decided to study three types of written texts, both countrywide and local documents. The selection of documents took place from November 2010 to July 2011.

The countrywide documents we selected were of two types: On the one hand, the Acts on preschool and compulsory education and four regulations (listed in Appendix A) that have to do with the school outdoor environment, altogether six documents; on the other, the national curriculum guides for the pre- and compulsory school levels (listed in Appendix B)—14 documents in all. Also, a letter was written to the Ministry of Education, Science and Culture to ask if they could suggest any other documents than the ones we had found. It was confirmed that we had the most important policy documents countrywide—20 altogether. These documents differ in that the Acts generate the framework for education and illustrate the main goals of education, the national curriculum guides more specifically describe the contents and the outcomes of education, and in the regulations, particular clauses regarding specific details of schools' operation are put forward.

The third group of documents consists of local policy documents, which deal with how the municipalities wish to implement the national curriculum guides, often with local emphases. In order to be able to map regional diversity, we chose to obtain documents from a range of communities across the country, both large and small, countryside and coastal. We collected and analyzed policy documents from eight main regions in Iceland (the capital city area, West Iceland, the West fjords, North West Iceland, North East Iceland, East Iceland, South Iceland, and the Reykjanes Peninsula). The main rule was that in each region, we chose both the largest municipality and, randomly, a smaller one. As an exception, however, we decided to include four municipalities in which were located schools which participated in the so-called GETA project (E. Research and school

development project on education for sustainable development) (Bergmann et al., 2010; Jóhannesson et al., 2011). This was done because the schools had emphasized the outdoors in their projects and, therefore, the likelihood was greater that these municipalities would have some references to the outdoor environment in their policy documents. In one of the regions, two municipalities other than the largest participated in the GETA project, and therefore three municipalities were included for that particular region. This resulted in a sample of 17 municipalities (of a total of 76 in the country), with populations ranging from 300 inhabitants in Tálknafjörður in the West Fjords to 118,000 inhabitants in Reykjavík, the capital of Iceland.¹

With regard to the selection of policy documents from the municipalities, the first choice was the municipalities' school and education policy if available and Agenda 21 which is a document often addressing education. Thus, these are the main types of documents we collected. To ensure that we were not missing any important sources in this regard, a letter was written to the municipalities involved, explaining which documents had been collected and asking if they could identify any other important documents in these areas. Some of the municipalities suggested other documentation, such as family, health, or communications policies; we decided that it was important to include these, although they were not education policy documents in a narrow sense. Another round was then taken to ask other municipalities if they also had these documents. As a result of this procedure we found 18 school policy documents, 10 Local Agenda 21 or environmental policy papers, seven family policy documents, and 10 other records of various types in which the outdoor environment was discussed. From each municipality we found between one and seven documents, or 45 altogether (see Appendix C).

We consider that these 65 documents give a fair picture of the policy regarding the outdoor environment, both countrywide and at local municipality level. The local documents cover municipalities in which around 60% of the nation live. Analyzing documents from, for instance, more of the larger municipalities around Reykjavík, or more communities that might have an exemplary policy in this regard, could have given us a more diversified picture.

Document Analysis

The third step of the research was to identify the discursive themes in the documents. Discursive themes are recurrent ideas that can be identified, as well as ideas which one expects to

¹Other communities are: In the capital city area, Mosfellsbær (a town of 8500 with a medium-sized farming area) and Álftanes (a community of 2500); in West Iceland, Akranes (a town of 6600) and Stykkishólmur (a village of 1100); and in the West fjords, along with Tálknafjörður village, mentioned earlier, Ísafjörður (a small town of 2600). In North West Iceland are Skagafjörður (an area with a central municipality of 4000, including a town of 2600, a couple of small villages, and a large rural farming area) and Blönduós (a village of 800); in North East Iceland, Akureyri (the fourth largest town in Iceland and two small island villages; total population 17,500) and Hörgárbyggð (a rural farming area together with two small villages; total population 400); in East Iceland, Fjarðabyggð (a municipality totalling 4500 and comprising five towns and villages and a rural farming area) and Djúpavogshreppur (a village and a small farming area; total population 350). In South Iceland are Árborg (a municipality of 7800 comprising one town, two villages, and a rural farming area) and Skeiða- og Gnúpverjahreppur (a rural farming area of 500). In the Reykjanes Peninsula are Reykjanesbær (a municipality of 14,000 consisting of one town and a tiny village) and Grindavík (a small town of 2800).

find but which are seldom or not at all mentioned (Foucault, 1979; Jóhannesson, 2006, 2010; Sharp & Richardson, 2001). It is important to recognize what is not talked about. Such silences are part of the discourse, because they indicate what is considered legitimate not to talk about (Jóhannesson, 2006), as turned out to be the case in this discourse. Thus, silence can be considered to be a discursive theme. The researchers were familiar enough with the discourse on the role of the outdoors in children's education from their own experience and from reading the literature (Bergnéhr, 2009; Halldén, 2009; Kernan & Devine, 2009) to recognize some of the themes involved in the discourse.

The first author used a computer search to find terms such as outdoor environment, outdoors, nature, neighborhood, schoolyard, playground, outdoor education and outdoor play to discover whether the sources addressed the outdoor environment.² Then the documents were read and reread to find how these terms were used. Some of the anticipated themes were identified, such as the idea that nature is beneficial to children, various reasons why nature is good for children, and concern about children's safety outdoors. Through the reading of the documents, other themes emerged. The findings were discussed with the second author. When determining which ideas were dominant ideas or discursive themes in the policy document, we counted the number of documents in which they were discussed (see Table 1). In that way we could see if some themes were missing or if some were mentioned in many documents, and if some themes were more common in certain types of documents rather than others. Even if the frequency of discursive themes was not the main interest of our analysis, we found counting them was informative, and these data supported the findings of the qualitative analysis of the documents. Thus the process of identifying discursive themes is at once qualitative and quantitative; it is a qualitative endeavour in that it is based on the judgment of the researchers, but it is also assisted by quantifying occurrences.

The fourth step was to analyze the conflicts and tensions in the discourse, whether obvious or not. The discursive themes create patterns in the discourse in the form of direct and indirect rules about what one can and ought to say, and also what people should avoid saying if they want others to listen to them. These patterns we call "legitimizing principles" (Jóhannesson, 2010; Bourdieu, 1988).³ Once such principles have emerged, then ideas and practices gain their legitimacy in how they connect to and contradict existing principles.

The fifth step of the analysis was determining the historical conjuncture of discourses; that is, finding out what happens when some ideas and practices gain more legitimacy than others in the discourse, and why this is the case. Jóhannesson (2010) and Sharp and Richardson (2001) also recommend a written report as a sixth step. In this research, a draft report was written.

Findings: Discursive Themes

In the analysis, eight discursive themes were identified. They answer the research question of whether, how, and why the documents consider outdoor environment important. The discursive themes were established in terms of both the number of countrywide and local policy documents in which they appeared and their importance in particular documents.

²In Icelandic: *Útiumhverfi, úti, náttúra, nágrenni, skólalóð, leikvöllur, útikennsla, útileikur*.

³In one of the studies we referred to in the introduction, the authors (Kernan & Devine, 2010) talk about dominant discourses in the same way as we talk about legitimizing principles in the discourse.

The order of the themes here is as follows: First, we discuss those that we consider most important in the laws and the regulations. The other six themes are presented in order of their frequency in documents from the municipalities and the national curriculum guides. Table 1 illustrates in how many of the three different types of policy document and in how many municipalities the discursive themes are to be found.

Table 1

Discursive Themes in Laws, Regulations, National Curriculum Guides, and Selected Municipal Policy Documents

Name of each discursive theme	Laws and regulations (6)	National curriculum guides (14)	Municipal policy documents (45)	The number and percentage of municipalities (17)
The risky outdoors	5 (83%)	1 (7%)	16 (36%)	10 (59%)
The good outdoors		7 (50%)	31 (69%)	17 (100%)
The outdoors as a learning environment	1 (17%)	9 (64%)	22 (49%)	14 (82%)
The outdoors as an arena for exercise and a healthy lifestyle		3 (21%)	28 (62%)	13 (76%)
The outdoors as a playground	3 (50%)	2 (14%)	14 (31%)	9 (53%)
The outdoors as an arena for building attitudes towards the environment		5 (36%)	16 (36%)	8 (47%)
Utilization of the outdoors to further people's pride of place			10 (22%)	7 (41%)

Note. Number and percentage of the three different types of policy document where each particular discursive theme is mentioned. The last column shows the number of municipalities—and percentages of them—in which the discursive themes are present.

Silence About the Outdoor Environment in Legislative Documents

The school outdoor environment is not discussed much in the legislation, in comparison with how carefully the school buildings are defined. This is important in relation to what appears in the national curriculum guides and other policy documents. We believe we can label this as silence because opportunities to deal with the outdoor environment, as any other learning environments, are rarely used. In the Act on Preschool Education (no. 90/2008), the outdoors is not addressed in any way, but the Act on Compulsory Education (no. 91/2008) states that an outdoor play area should be available in each school. This incongruence relating to those two school levels is peculiar, especially because outdoor play has been emphasized in the national curriculum guides for preschool since the first such guides were published (Ministry of Education, Science and Culture, 1985, 1999; 2011a).

The regulations relating to preschool operation have long included a certain frame of reference about the size of preschool playgrounds (Regulation on preschool operation No. 225/1995, article 5). In the newest regulation on preschool operation, such references have been cut out; instead, there is a clause stating that preschools should provide the minimum necessarily facilities (Regulation on preschool operation No. 655/2009, Article 5). These are defined as a planned playground with emphasis on multiple play and learning opportunities with regard to diverse age groups and diverse needs of children, including children with disabilities.

The Risky Outdoors

Security in outdoor playgrounds is a frequent theme in the policy documents. It appears in the compulsory school law, and there are four regulation standards that address this at the pre- and compulsory school levels (see Appendix A). In the national curriculum guides for pre- and compulsory schools there is not much emphasis on this; the subject is discussed in 7% of them, whereas in the municipal policy documents this theme is the fourth most common, featuring in 59% of the municipalities.

The security stipulations aim at preventing accidents and improving children's safety by ensuring that play equipment and playgrounds are constructed and maintained as safe and adhering to an acceptable standard (Regulation on safety of playground equipment and playgrounds and their inspection, no. 942/2002, Article 1). Playgrounds should be placed where children cannot be disturbed or exposed to hazards from the environment, for example traffic noise, falling from or into dangerous obstacles, or risk of drowning. Furthermore, there are stipulations about hygiene on the ground, e.g. how often sand should be changed in a sandpit. In addition, there is a long list of stipulations on the secure construction of play equipment and about safe surface material in the playgrounds (Regulation on safety of playground equipment and playgrounds and their inspection, No. 942/2002). In the Regulation on hygiene (No. 241/2002, Article 19), schools are listed as "houses and premises" where dogs, cats, and other animals may not be kept. This could be seen as prohibition of keeping animals in the playground or schoolyard. It is stated, furthermore, that children are the school's responsibility while in the school buildings, in the school grounds, and on field-trips under the auspices of the school (Regulation on construction and equipment of compulsory school buildings and grounds, No. 657/2009, article 7; Regulation on preschool operation, No. 655/2009, Article 9).

In policy documents from the municipalities, emphasis is placed on the man-made environment meeting security standards. In a few communities this is discussed in broader terms, as in the family policy from Álftanes which states that "children's guardians should be informed about how to avoid dangerous places such as canals, ponds, and small islands" (Sveitarfélagið Álftanes, 2004a, p. 5; all translations are ours). But in the school policy from Ísafjörður, children are supposed to "know their environment, learn to enjoy it, protect it and beware of the dangers it may contain" (Ísafjarðarbær, 2008a, p. 5). The way in which environmental threats are seen in these two documents, and the recommendations given on how children should be taught to act when exposed to them, vary considerably. On the one hand, places that are considered dangerous and which children should avoid are listed; on the other, knowing the environment is emphasized for the purpose of making children capable of tackling the potential risks involved.

The Good Outdoors

The theme of the outdoors being good for children is most common in the policy documents from the municipalities (see Table 1). Even though this is not always mentioned directly, it is obvious from the emphasis placed on being outdoors that it is seen as beneficial to children. This theme is also apparent in the new national curriculum guide for preschools (Ministry of Education, Science and Culture, 2011a), but receives less attention in the general section of the new national curriculum guide for compulsory schools (Ministry of Education, Science and Culture, 2011b). There are references to the benefits of the outdoor environment in half of the subject sections of the national curriculum guides for the compulsory school from 2007.

In all 17 municipalities studied (see Table 1), children's connection to the outdoors is dealt with as something worth striving for in at least some of the policy documents from each municipality. Some deal with the matter in several documents (five out of seven), while in others it is only mentioned in one document (e.g., one out of five). The outdoor environment focused upon in these documents is mostly concerned with nature and the environment in the neighborhood of the school, but there is less emphasis on the environment that the children are in closest contact with—the schoolyard and playground. An exception to this is a stipulation in the new national curriculum guide for preschool to the effect that in the planning of the playground, children's experiences of different natural phenomena should be considered.

The Outdoors as a Learning Environment

The national curriculum guides for both preschool and compulsory school levels highly recommend using the outdoors as a learning environment, it is mentioned in nine out of fourteen documents (see Table 1). The new curriculum for preschools contains a special chapter about the learning environment, stressing that the learning environment is both inside the school building and outdoors, in the playground and in the school neighborhood, and encompasses both nature and man-made surroundings. The playground is regarded as an important learning environment that should provide opportunities for children's enquiries and for increasing possibilities, and should "offer diversity in landscape, soil, plants and materials children have access to" (Ministry of Education, Science and Culture, 2011a, p. 27).

Not surprisingly, using the outdoors to learn about natural phenomena is emphasized in the national curriculum guide for natural sciences and environmental education (Ministry of Education, Science and Culture, 2007i). But the outdoors is also seen as a good learning environment for other subjects. Examples include cooking on a grill in home economics (Ministry of Education, Science and Culture, 2007b, p. 27) and learning mathematics outside (Ministry of Education, Science and Culture, 2007k). In arts, the outdoor environment is seldom specifically referred to, but it is frequently suggested that children should use their environment (outdoors as well as indoors) in art education (Ministry of Education, Science and Culture, 2007g, pp. 10, 16, 24, 50), and in physical education one of the objectives is that children should "practice athletics and games in the schoolyard or in the neighborhood of the school" (Ministry of Education, Science and Culture, 2007e, p. 34). The new national curriculum guide for the preschool stresses that children's learning environment is both inside and outside, and that when the construction of a playground is planned, the opportunities it offers as a learning environment should be considered (Ministry of Education,

Science and Culture, 2011a, p. 27). In the national curriculum guides for both pre- and compulsory school levels, the outdoors is mostly discussed as a venue suitable for learning about nature and the environment.

In 82% of the municipalities' policy documents, the outdoors is discussed as a learning environment. Often outdoor education is discussed as an approach to teaching without pointing out for what purpose. Sometimes this is referred to as a way to increase diversity in teaching. Using the outdoors to learn about nature and the environment is often mentioned in policy documents such as Agenda 21 from Reykjavík (Reykjavíkurborg, 2006), which states that "public outdoor areas [I. útivistarsvæði] should be used more for instruction and in school curricula with an emphasis on nature." In the documents in general, the discussion emphasizes that children should discover their own neighborhood by direct experience and thus learn to enjoy and appreciate their surroundings.

The Outdoors as an Arena for Exercise and a Healthy Lifestyle

Use of the outdoors as an arena for exercise and healthy lifestyle is emphasized in three of the national curriculum guides for preschool and compulsory school levels (see Table 1). One of the so-called "guiding lights" in the national guide for preschools is that children should have opportunities for diverse physical activity and for staying outdoors (Ministry of Education, Science and Culture, 2011a, p. 25). In the compulsory school national curriculum guide for athletics, body, and health, it is stressed that children should have opportunities to practice outdoor activities to further their health and a healthy lifestyle and become aware of the importance of those aspects (Ministry of Education, Science and Culture, 2007e, p. 10). Using the outdoors for further exercise and to support a healthy lifestyle is a common theme in the municipalities' policy documents; in fact, it is the third most common theme in the research sample. Often this is expressed as encouragement for different kinds of developmental projects, emphasizing exercise and outdoor life.

The Outdoors as a Playground

In the Act on the compulsory school (2008), the Regulation on the structure and equipment of compulsory school buildings and schoolyards (No. 657/2009), and the Regulation on preschool operation (No. 655/2009), it is stipulated that the school outdoor environment must provide diverse opportunities for play and learning. In the national curriculum guide for preschool, outdoor play is mentioned in connection with learning and exercise, and in the national curriculum guide for compulsory school the schoolyard is connected with play.

In 9 of the 17 municipalities (see Table 1), the outdoor environment is identified as an arena for play. The schoolyard and the playgrounds are referred to as offering multiple play opportunities and meeting the needs of different children of all ages. How the environment is supposed to meet these requirements is not discussed, however.

The Outdoors As an Arena for Building Attitudes Towards the Environment

National curriculum guides for preschools and compulsory schools present aims about developing children's respect for nature and the environment, as well as learning to use this in a responsible way. Some of the guides (36%) relate those ideas to the outdoors

(see Table 1). In addition, there is discussion of the importance of children having opportunities to experience and enjoy the outdoors, either directly or indirectly.

In a little less than half of the municipalities' policy documents there are examples of discussion about the importance of children's positive experience and enjoyment of the outdoors as a significant preparation for their willingness to protect nature and the environment. The Agenda 21 document for Akranes, for example, states that "environmental education is not least about experiencing nature, learning to enjoy it and understand it" and "positive experience and perception should be emphasised, thus creating a solid basis for the protection of nature and the environment" (Akraneskaupstaður, n.d.).

Utilization of the Outdoors to Further People's Pride in Place

Lastly, we report an unexpected theme that emerged from the municipalities' policy documents. In nearly half of the municipalities (see Table 1), the documents referred to the use of the outdoor environment to further people's love for their home district—to develop their local patriotism. This is similar to what Guðmundsson (2000) calls local awareness (*I. grenndarvitund*) and Valdimarsdóttir (2009) has referred to as people's pride of a place (*I. staðarstolt*). The last concept, at least in Icelandic, is used in the same manner as in the policy documents. This pride of, or in, place has been used in an attempt to discourage migration from the countryside to the cities (Högmö, Solstad, & Tiller, 1981; cited in Guðmundsson, 2000).

In the policy documents, this pride appears in references to the uniqueness of the municipality regarding nature, and also sometimes, aspects of local history in which children or residents in general should take particular pride. For example, in the school policy of the municipality of Skagafjörður (Sveitarfélagið Skagafjörður, 2008, p. 3), one of the four main objectives is that the schools in the municipality should highlight the uniqueness of their school environment, nature, history, and the culture of the home municipality, and this is to be done by using the outdoors in children's learning. In the school policy of Akureyri (Skóladeild Akureyrarbæjar, 2006, p. 13), one of the aims is that schools in Akureyri should be living centers in their neighborhoods, actively connected with the municipality's environment, nature, economy, and culture. Here, also, the outdoors is seen as an important vehicle for achieving those aims.

Discussion

This study aims to shed light on the question of what characterizes the discourse on the role of outdoor environment in children's learning in Icelandic policy documents. Here we discuss what we have identified as legitimating principles in the discourse, as well as focusing on the contradictions, tensions, surprises, and gaps in the discourse.

Legitimizing Principles in the Discourse

We identified three sets of ideas that we consider legitimating principles. The first is the silence or scant information about the outdoor environment, especially in the legislative documents concerning its role as a learning environment. This indicates that these surroundings do not have high status as learning environments. The new national curriculum guide for

the preschool (2011a) is an exception, stressing that children learn outside the school building as well as inside.

Our approach in this study is different from the research findings we summarized at the beginning of the article. We were not focusing on the perspectives of those who participate in discourse about the outdoor environment in children's education. Instead, we examined whether this topic is discussed at all in materials about education in general and, if so, how it is discussed. This is the reason why silence about the outdoor environment has not been especially identified in the studies we referred to in the introduction. Bergnéhrs (2009) finding, however, that articles addressing the outdoors in preschool journals only constituted a small proportion of the material published in those journals compared to discussion on other aspects of children's education, is also an indication that the outdoor environment does not feature prominently in the educational discourse in general. In this regard, our finding of silence as a legitimating principle can also be seen in previous research in the Nordic countries.

Another legitimating principle in the Icelandic discourse concerns children's safety in the outdoors. This is consistent with research by Kernan and Devine (2010) and Bergnéhr (2009). The discourse contains a contradiction between securing children's safety in the outdoors, on the one hand, and giving them opportunities for experience, to learn, and to discover how to tackle the challenges in the environment on the other. In some countries (Malone, 2007) it seems that the safety aspect has overridden discourse on the educational value of the outdoors, but in Icelandic policy documents this does not seem to be the case.

The third legitimating principle focuses on the outdoors, especially nature, as being beneficial for children; therefore, we should give them opportunities to experience it. This is in coherence with previous research (Bergnéhr, 2009; Garrick, 2009; Halldén, 2009; Kernan & Devine, 2010; Nilsen, 2008). There are different reasons why it is good for children to be outdoors. The outdoors is a suitable learning environment, it is beneficial for children's physical development and health, and it is a convenient space for children's play. These reasons can be seen as legitimating principles and they are all consistent with the findings of Bergnéhr (2009) and Kernan and Devine (2010). In addition, two discursive themes regarding the view that the outdoors is of benefit to children had to do with children's attitudes. One theme concerns itself with children fostering positive attitudes in general towards nature and the environment and towards protecting it; another focuses on building up people's pride of place or pride in their home municipality by getting to know the natural surroundings. Both have to do with respecting nature and the environment. Bergnéhr (2009) also found this same discussion in her analysis. This is a common theme in the literature concerning environmental education or education for sustainable development (Norðdahl & Jóhannesson, in preparation; Bögeholz, 2006; Chawla, 1999; Wells & Lekies, 2006), so it can also be counted as a legitimating principle in the discourse on the role of the outdoor environment in children's learning.

Contradictions, Tensions, Surprises, and Gaps in the Discourse

We have identified several contradictions and tensions in the discourse, as well as some surprises and gaps. Identifying gaps in a discourse could be an endless activity, but while analyzing the documents, it was found that some gaps were more significant than others, as they indicated contradictions in the discourse. In the analysis, this brings us to the level of the

historical conjuncture of ideas and practices, or finding out what happens when some ideas and practices gain more legitimacy than others in the discourse, and why this is the case.

The first contradiction is that there is silence about the outdoors in the regulations but more emphasis on the subject in the national curriculum guides and local policy documents, which tells us that the emphasis on the outdoor environment in the curriculum is not supported by law. Even if it is not the role of the Acts to stipulate how teaching should be organized, it is important that in the laws the conditions for children's various learning possibilities is considered. This lack of support cannot be explained by the fact that the laws are older than the curriculum, because the laws were enacted by Parliament shortly before most of the curricula were written. It is strange that laws and regulations do not participate in this discourse, and we wonder why references to the size of playgrounds in preschool were removed from the newest regulation about the preschool operational environment. Is it possible that the outdoor environment does not have any legitimacy in the mind of the politicians and others who write the laws and regulations? Or, possibly, was this done as part of decentralization of the educational system in order to increase the independence of the communities, and often certain schools? This opens up the possibility that some municipalities may use the opportunity to save money by only assigning a minimal outdoor area for preschools, and thus sacrifice the potential the outdoors has to offer for children's development and well-being.

The second contradiction is between risk, on the one hand, and learning opportunities, on the other. This contrast is to be expected, as it is found in the international literature. While this is an important contradiction in Iceland as well, there are, in general, fewer worries about risk in the Icelandic documents than those found, for example, among teachers in countries such as Ireland (Kernan & Devine, 2010) and the UK (Maynard, 2007). In these studies, teachers expressed concern about taking children outside because of possible lawsuits in the case of accidents. This raises the question of whether some action should be taken to counteract the power of this kind of discourse to prevent it from becoming established in Iceland. It is understandable that the regulation, which aims at security in school settings, takes this up. It is important to consider how this is formulated, and emphasis should be on teaching children to handle dangerous circumstances under the guidance of grown-ups instead of just avoiding them.

The third issue we discuss under this heading came as a surprise in the analysis; that is, the focus on local pride, an element we had not foreseen as a specific discursive theme. This corresponds to the concept of attachment to a place (Avriel-Avni et al., 2010; Gruenewald, 2003) and also to the notion of robust children loving their home environment and actively living in it (Nilsen, 2008). In the municipal policy documents this is linked to nature and belonging to a municipality. However, the idea can also be used on a smaller scale inside the schools with regard to the playground or the schoolyard. Kernan argues that the literature about young children belonging to a group or a municipality mostly focuses on social interaction and contact between people. She wants to expand the discussion and involve the environment, looking at the interrelationship between "the physical, cultural and social conditions of young children's lives" and how we can connect personal identity to place identity and the feeling of belonging to a municipality (Kernan, 2010, p. 203). Here she brings to our attention how we plan the indoors by trying to enable everyone to find themselves at home, and recommends that we should also look critically at the outdoors and what children are allowed to do there, since this can affect their identity and their relationship with the environment.

With regard to what we can identify as “gaps” in this particular discourse, we looked at certain aspects of the discourse about children’s learning in general, which are not mentioned in connection to the outdoors. For example, in Icelandic policy documents, such as the national curriculum guides for preschool and compulsory schools, there is an emphasis on children’s democratic participation both in the daily life of the school and also in society as a whole (Ministry of Education, Science and Culture, 2011a; 2011b). This is seldom connected to the outdoors, however, although the subject is mentioned in documents from a few municipalities. In contrast, according to Kernan and Devine’s (2010) review, democratic participation was one of the dominant discourses about the outdoors.

We specifically looked for gender in the documents and found nothing. We interpret this as indicating that the outdoors is seen as a gender-neutral place. Internationally, the focus on gender seems to be a new issue in discourse about the outdoors—for example, neither Kernan and Devine (2010) nor Bergnéhr (2009) mention it. Nevertheless, some research findings in this field indicate that the outdoor environment is not a gender-neutral arena for children or their teachers (Emilsen & Koch, 2010; Stordal, 2009; Thorne, 1993; Ärlemalm-Hagsér, 2010). The omission of a gender consideration did not surprise us; the Icelandic curricula have not been known to include emphasis on gender issues (e.g., Guðbjörnsdóttir, 2003). While the new national curriculum guides for Icelandic schools place no particular emphasis on gender equality in connection with the outdoors, the new curriculum guides for all school levels—preschool, compulsory and upper secondary—all begin with the same general section that focuses on gender as part of equality, along with several other cross-curricular themes, called “fundamental pillars of education.”

Conclusion

This article aimed to find out what characterizes the discourse on the role of the outdoor environment in children’s learning in policy documents in Iceland. We asked three specific questions. The first was whether, how, and why the documents consider the outdoor environment important; the second attempted to identify the principles legitimating the main ideas in the documents; and the third related to contradictions and tensions in the discourse.

The question of whether the outdoor environment is considered important in children’s learning has a contradictory answer. Although the role of the outdoors as something important in children’s learning is not highlighted in the documents in general, the discussion, so far as it occurs, shows a positive attitude towards this function. The answers to “how” and “why” are related: the outdoor environment is seen as an important factor which can further learning through opportunities to experience things through all senses. It is seen to stimulate health and well-being as a result of the opportunities it offers for physical exercise and enjoyment of being outside. It can offer children diverse options for play, and experiencing the outdoors fosters children’s positive attitudes towards nature and their willingness to protect it and take pride in it.

There are contradictory legitimating principles at work in the three groups of documents we studied, i.e., the laws and regulations, the national curriculum guides, and the policy documents from the municipalities. Those sources have little in common. Silence about the outdoor environment as an arena for play and learning and stipulations about security arrangements outdoors are the most telling characteristics of laws and regulations. Themes such as the role of the outdoor environment as a good and positive influence on learning, health, well-being, play, and shaping children’s attitudes toward nature and the municipality

are more typical of the national curriculum guides and policy documents from the municipalities. This tells us that the emphasis on the outdoor environment in the national curriculum guides and in the municipalities' policy documents has little support in law. We identify this as a contradiction in the discourse.

In general we can state that the discourse in the policy documents reflects a positive attitude towards using the outdoor environment in children's learning, even though it is not highlighted as a learning environment, except in the new curriculum guide for preschools. It seems that this discourse about schools' utilization of the outdoors is rather new in spite of a long tradition of seeing the outdoors as beneficial for children. The discourse seems to be marginal, and it does not address all major issues involved in the discourse on children's learning in general, such as democracy and gender roles.

It would be interesting to follow up on some of the results with interviews with politicians, for instance about the changes in regulations concerning the minimum outdoor area for each child in preschools. Also, we do not know if the written policy is enacted in all of the communities. It would also be interesting to know if the discourse in the policy about the role of the outdoors in children's learning has changed over time, and if so, why. Such studies might help to make the policy clearer and more effective.

References

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Appendix A

Laws and Regulations

- Act on Compulsory Education No. 91/2008*. [Lög um grunnskóla nr 91/2008]. Retrieved July 30, 2010, from http://eng.menntamalaraduneyti.is/media/MRN-pdf_Annad/Compulsory_school_Act.pdf
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Appendix B

National curriculum guides

- Ministry of Education, Science and Culture. (2011a). *National curriculum guide for pre-school* [Aðalnámskrá leikskóla]. Reykjavík: Author.
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Appendix C

Selected municipal policy documents

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Article 2

‘Let’s go outside’: Icelandic teachers’ views of using the outdoors

‘Let’s go outside’: Icelandic teachers’ views of using the outdoors

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This article discusses the views of 25 Icelandic preschool and compulsory school teachers who were interviewed on the role of the outdoor environment in children’s learning. The teachers reported not being afraid to take children outside. These teachers valued the learning potentials of the outdoors more than they feared the possible risks. They believed that the outdoors could provide opportunities for (a) enhancing children’s play and learning (b) promoting children’s health, well-being, and courage, and (c) affecting children’s views, knowledge, and actions towards sustainability.

Keywords: teachers’ views; outdoor environment; play and learning; well-being; health and courage; sustainability education

Introduction

Considerable concern has been expressed in many countries about children’s lack of opportunities to experience the outdoors and learn from these experiences. This study aims to enhance the understanding of how teachers see the role of the outdoor environment in children’s learning. Here, the use of the outdoor environment is seen as both teacher-directed activities and children’s free play-based activities, whether in schoolyards, playgrounds, or in the closest neighbourhoods of the schools. This is often referred to as school-based outdoor learning (Fägerstam 2013). (Hereafter, we use the terms schoolyard and playground somewhat interchangeably, or we use schoolyard when referred to compulsory schools and playground when referring to preschools.)

In Iceland as in other Nordic countries, the outdoors is seen as positive part of children’s lives (Garrick 2009; Halldén 2009; Nilsen 2008; Waller et al. 2010). In a study of discourses regarding the outdoor environment in Icelandic policy documents, it was apparent that the outdoor environment is seen as something good for children. In the curriculum guidelines of both school levels, the outdoors is emphasised as a learning environment, as a place for developing attitudes towards the natural surroundings, and as a place for exercise and a healthy lifestyle (Norðdahl and Jóhannesson 2013). This emphasis on the outdoors has a long tradition in Icelandic preschools intended for children from one to six years of age, where children play outside each day (Einarsdóttir 2001; Sigurðardóttir 1952). But in compulsory schools, intended for children from 6 to 16 years of age, children’s outdoor play has traditionally been limited to the break between classes. We do not know much about how

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teachers use the outdoor environment in children's learning, though it likely varies between schools as well as between teachers at each school. In Iceland, however, there are signs that compulsory school teachers are using the outdoor environment in the school curriculum more than they did before. In Reykjavík, the capital of Iceland, 70% of compulsory schools report that they practise outdoor education on a regular basis (Óladóttir 2008).

This study was done in connection with a year-long research and development project about education for sustainable development (ESD) in Iceland called ActionESD. The aim of this project was to further understanding of ESD and to determine what is needed to encourage children's actions in that direction. In this project, the teachers worked with specialists in teacher education, and the outdoor environment was not especially emphasised on their behalf. However, from the beginning of the ActionESD project, many of the participating teachers strongly connected outdoor education and ESD and discussed them in some cases synonymously. Thus we thought that it was of interest to investigate how teachers connected outdoor education and ESD as well as how they saw the role of the outdoors in children's learning in general. Furthermore, in spite of national curriculum guidelines, teachers are the ones who mainly decide whether and how the outdoor environment is used in children's education, and consequently it is of considerable interest to study how they see the role of the outdoors in the school curriculum.

Theoretical background

Five types of theories and concepts about learning have influenced the research question and the interpretation of data. These include experience and communication, place-based education theory, theories of children's participation and decision-making, and the concept of affordance.

This study is influenced by the view that children's experience of the physical environment is important for their learning. In the literature about outdoor education it is obvious that the experience offered by the outdoors is the core of outdoor education (see e.g. Jordet 2010; Priest 1986). Dewey (1938/2000) saw experience as a communication between the (physical and social) environment and the individual involved. He argued that experience involves both active and passive elements; the active element consists of trying to do something, and the passive element involves undergoing the consequences of what we did (Dewey 1916/1966). When a child is building a sand castle, the sand 'reacts' depending on what the child does and how wet it is. According to Dewey (1916/1966), this is an educational experience for the child if he or she reflects on how the water affects the sand in the construction of the castle. It is the teacher's obligation to choose an environment in a teaching situation that is likely to suit the children's abilities and needs in providing an experience that is of value for the children's education (Dewey 1938/2000).

The study is also influenced by the view that communication is important in children's learning. Dewey (1938/2000) saw the importance of reflection as a very important part of experience. The socio-cultural theory of learning drawn from Vygotsky (1978) supports this and has influenced our view of how social interaction affects learning. Vygotsky saw communication between people to be important in the learning process and some things people can only learn from other people. According to this theory, children learn by interacting and discussing with other children and adults, especially those that are more knowledgeable than they. Language is thus seen as very important in the learning process (Vygotsky 1978).

Since the places where outdoor activities take place are of importance for this study, place-based theories have been influential. Place-based education emphasises using the places where children live, the local environment, and the community in the school

curriculum. By this, place-based education addresses one of Dewey's central concerns that schools should not be isolated from the community around them but rather use it both as physical and social learning environment and participate in it (Smith 2013). Greenwood (2013, 93) argues that place-conscious education can contribute to environmental education 'that is culturally responsive, and committed to care for land and people, locally and globally'.

As this study is done in a project about ESD, the theoretical background for ESD has influenced the study, especially ESD's focus on children's participation and decision-making regarding their local environment based on their own experience and knowledge. It is seen as important to encourage children to act on their decisions in favour of the well-beings of themselves and others (Breiting 2008). These theories are built on children's right to be heard on issues that affect them (United Nations 1989, 2005) and to be recognised as competent participants in society (Dahlberg and Moss 2005; Einarsdóttir 2012). Some scholars stress the importance of empowering children so they can see themselves as actors of change in their own lives and in society (Ärlemalm-Hagsér 2012; Davis 2010; Ferreira 2013; Percy-Smith 2010). Therefore, getting to know the local community and participating in it by means of integrating the outdoor environment into children's learning is seen as an important part of sustainability education (SE) (Ardoin, Clark, and Kelsey 2013; Kozak and Elliott 2011) and in developing action competence (Breiting and Mogensen 1999; Jensen and Schnack 1997).

In collecting and analysing the data about teachers' ideas of the role of the outdoor environment in children's learning, the study draws on Gibson's (1979) theory of the affordance of the environment. Gibson saw people's interpretation of what the physical environment has to offer for their actions as the affordance of the environment. The affordance also has to do with the capability of the people involved, and it may not be the same for all. Thus the affordance of the environment describes the interaction between people and the environment.

Teachers' views of the outdoor environment

When reviewing the literature about how teachers see the role of the outdoor environment in children's learning, it is apparent that they focus on how the outdoor education can affect children in multiple ways and how it can be used in education.

The outdoor environment offers experiences important for children's learning

Studies of teachers' views in relation to the outdoors show that they believe children's experience outdoors is important in their learning. Preschool teachers in Scandinavia see outdoor play on a playground as an important part of children's everyday experience in preschool (Björklid 2005; Moser and Martinsen 2010; Szczepanski and Dahlgren 2011). The sensory stimuli the outdoor environment offers are often seen as important for children's learning. An example of this is the preference of early childhood educators in Canada who wanted the playground in preschools to provide diverse opportunities of experience. Most of them wanted more sensory stimuli installed, such as plants, shade, and water, as well as space and more challenging facilities, such as play equipment, fences, and small houses to play in (Herrington 2008). Preschool student teachers in the USA shared this view and stated that they would use the natural outdoor environment mostly because of the opportunities it offers for children's varied experiences (Ernst and Thornabene 2012).

It is interesting to note that often the outdoor environment, or schoolyard, most accessible in the compulsory school is not seen as part of the teaching environment. Thus only one out of five Swedish compulsory school principals regarded the schoolyard as a teaching resource and instead mostly saw it as a place for children's play and social interactions (Björklid 2005). Other studies show that teachers in Swedish compulsory schools (Magntorn and Helldén 2006; Szczepanski and Dahlgren 2011), as well as secondary school teachers, (Fägerstam 2013) stressed the importance of children's outdoor experiences for their learning. Similarly, teachers from Finland, Sweden, the UK, and the USA found that their school garden programme improved children's learning (Education Development Center and Boston Schoolyard Funders Collaborative 2000).

The outdoor environment provides opportunities to further children's health and well-being

There is also a widespread belief that spending time outdoors, especially in a natural, pollution-free environment, is good for children's physical health and well-being. In studies from Australia (Davis 2010), the USA (Ernst and Thornabene 2012), and Sweden (Björklid 2005; Szczepanski et al. 2006) preschool and compulsory school teachers, as well as student teachers, have been found to share this view.

Despite the benefits of using the outdoors in children's learning, teachers in many countries are concerned about diverse risks in the outdoor environment (Kernan and Devine 2010; Rickinson et al. 2004). This concern has developed in recent years or decades and Stephenson (2003) sees it as the impact of discourse about the dark side of risk, emphasising the possibility of failure and injury. How people view risks differs in different countries. In studies of preschool practitioners' attitudes in Norway (Sandseter 2012) and Australia towards children's risk-taking, practitioners from both countries found children's risky play important for their development and well-being. But a difference was found in the extent of their support for such play, with the Australian practitioners identifying more difficulties in doing so than the Norwegians (Little, Sandseter, and Wyer 2012). Preschool student teachers in the USA mentioned safety concern as one of the reasons for not wanting to use the natural environment in children's education (Ernst and Tornabene 2012). However, physical challenges or risk-taking are among the possibilities the outdoor environment often offers and which many children enjoy (Norðdahl and Einarsdóttir 2014; Sandseter 2010; Stephenson 2003).

The outdoor environment offers opportunities to further children's environmental awareness

Being outdoors and experiencing nature is often believed to cultivate children's positive attitudes towards the environment and their willingness to protect it and live in a more sustainable way (Chawla 2007; Davis 2010; Louv 2010). Findings from two Swedish studies indicate that preschool teachers (Ärlemalm-Hagsér 2013) and compulsory school teachers (Szczepanski and Dahlgren 2011) share this belief. Environmental education centres personnel and secondary school teachers from Australia have also found encounters with, and knowledge about, nature to be important for developing children's environmental concerns as well as their place identity (Fägerstam 2012). Rickinson et al. (2004), however, note that research findings do not support the hypothesis that nature experiences automatically further children's environmental awareness and action. Sandell and Öhman (2010) point out that in the 1980s, the connection between outdoor experiences and people's willingness to take care of nature and do something to preserve it was seen as the main role of

outdoor education. They state that a more pluralistic approach in environmental education in later years has created a danger that people's relation to nature will be neglected in environmental education and, later, in SE.

Research focus

In a literature review of research on outdoor learning, Rickinson et al. (2004) indicate 'blank spots' in our knowledge of how teachers see the outdoor classroom and what aims are important to seek. In this article we explore the views of 25 Icelandic teachers on the role of the outdoor environment in children's learning. This study also contributes to our knowledge of how teachers connect the use of the outdoor environment to ESD as the participants in the study had experience in using the outdoors in children's learning and had also participated in a project about ESD.

The study will explore how teachers with experience in outdoor education and who participated in an ESD project view the role of the outdoor environment in children's learning.

Method

Participants

The sample in the study is a purposive sample (Lichtman 2010) drawn from eight schools participating in a research and development project intended to study and promote ESD, called ActionESD (Educational action for sustainable development) (see e.g. Jóhannesson et al. 2011). As these teachers had experience in using the outdoor environment in their teaching, and were involved in a project on SE, which focuses, among other things, on attitudes and actions towards the environment, they were likely to connect ESD to the use of the outdoors. Both experiences mean that these teachers are likely to be 'information-rich' sample (Gall, Borg, and Gall 1996, 218) knowledgeable about the role of the outdoor environment in children's learning. Altogether, 25 teachers, compulsory school principals, and preschool directors from four compulsory schools and four preschools were interviewed in the spring of 2009 after a year-long cooperation in the ActionESD project.

From each school participating in the project, the principal or the director was selected for this study, along with a project contact person with the ActionESD group, and one or two other teachers participating in the project (see also Pálsdóttir and Macdonald 2010). Four compulsory school principals (P), Baldur, Rafn, Ingibjörg, and Kolfinna, and four preschool directors (D), Alda, Freyja, Hildur, and Sara, were interviewed. Eight compulsory school teachers (CT), Birna, Björk, Ingunn, Inga, Klara, Katla, Rakel, and Ragna, as well as nine preschool teachers (PT), Alma, Anna, Fanny, Frigg, Hekla, Hulda, Sif, Sjöfn, and Sunna, were interviewed individually, except for one preschool where an interview with four was conducted. All names are pseudonyms. We refer to the whole group as teachers, interviewees, or participants.

Most of the compulsory teachers taught young children (six to nine years of age), but some also taught at a middle (10–12 years of age) or at secondary school level (13–15 years of age), for example, science teachers. Participants from the preschools were qualified preschool teachers, one being an art teacher and one a preschool student teacher. In addition, there was one preschool practitioner with no teacher education. The participating pre- and compulsory school teachers were 29–63-years old; they had a working experience of 5–32 years with an average of a little over 18 years. The average management experience of principals and directors was about seven and a half years.

Data gathering and analysis

Interviews were conducted at the end of the ActionESD project to study teachers' and principals' ideas about the outdoor environment and its role in children's learning, both in SE and education in general. These interviews dealt with different aspects of the project. The duration of individual interviews ranged from 40 to 130 minutes and the group interview lasted 108 minutes. Two researchers, always including one of the authors, were present at each interview, and the majority of the interviews were conducted by the third researcher (Pálsdóttir and Macdonald 2010). While specific questions regarding the outdoor environment constituted a relatively small part of these interviews, the participants often expressed their views about the outdoors in discussions focusing on other issues.

In the interviews, the participants were asked about different aspects of the role of the outdoor environment in children's learning. They were asked whether they used the school's outdoor environment with the children, why and how they used it, and what kind of outdoor environment they preferred in the school neighbourhood to further children's play and learning.

The intention in the study was to investigate the diversity of teacher's views on the role of the outdoors or the affordance of the outdoor environment. Even though we were acquainted with the relevant literature and theories, we tried to keep an open mind and waited to see what the data would tell us. We used a thematic research analysis method described by Braun and Clarke (2006) in this process. The interviews with the teachers were transcribed, read many times, and coded according to how the teachers saw the affordance of the outdoor environment in children's learning. Then potential themes from the codes were identified. In reviewing the themes we decided to make clusters of themes, and in the end there were three themes we could clearly define and name. In this process, a draft report about the findings was compiled.

Validity and limitations

This purposive sample is simultaneously valuable and yet has limitations. It is valuable because the researchers became acquainted with the teachers during their year-long cooperation. We also knew a lot – but not all – about the situation and the outdoor environment around each school. This gives us the confidence to state that the answers are honest reports. The sample is also valuable because all the teachers had experience in using the outdoor environment in children's learning. The main limitation of the research relates to the fact that the interviews were conducted in the context of an evaluation of teachers' experience in a SE project. This could have encouraged the teachers to connect the use of the outdoor environment to SE and thus the result should be seen in this light. Such a context also offers less opportunity to make general conclusions about other teachers' views from the findings of this study. At the same time, these teachers provided information about the connections of the affordance of the outdoor environment and ESD that was valuable for answering the question asked in the study.

Findings

All our participants had experience in using the outdoor environment in their teaching. Some of the compulsory school teachers used the outdoors occasionally, for example, in the spring or autumn, or when it was relevant to the topic they were working on, while others used the outdoors more often, even once a week. The preschool teachers said the children played in the playground each day, although there were days when they did not

go out because of bad weather. They mentioned going outside the playground once or twice a week in the summertime. Most of the teachers of both school levels referred to the outdoor environment beyond the schoolyard or playground when asked about outdoor area they used in their teaching. Most of the compulsory teachers referred to the natural environment when asked about this, whereas the preschool teachers referred to both natural and man-made environments. The compulsory school teachers said the places they visited outside the school grounds were forests, moor and grasslands, riverside, and the seashore. The preschool teachers said they visited moors – and grasslands, the seashore, a tree garden, and other playgrounds in the area. They also investigated the roads and the location of children's homes and visited institutions of the municipalities, museums and diverse workplaces in the neighbourhood.

In the analysis, three overarching themes or clusters of themes emerged from the data about the affordance of the outdoor environment according to the teachers: (a) children's play and learning, (b) children's health, well-being, and courage; and (c) children's views, knowledge, and actions towards sustainability. Here these three themes will be described and examples from the interviews given.

Children's play and learning

The first major theme we identified in the analysis of the data was the teachers' perception of the outdoor environment as a place for children's play and learning. The compulsory school teachers mentioned using the outdoors to teach different subjects like language, music, mathematics, and cooking. Most importantly, they explained how they used the outdoors to teach about the environment through all their senses.

Many interviewees reported that it is important for children to have their own experience of things outside. As Rakel (CT) said, she thought that when outside, the children:

are not in a constructed environment discussing things that are maybe in the school ground ... It is easier for them to learn the concepts when they have real examples and experience things instead of just reading about them. The experience is the most important.

A few compulsory school teachers mentioned using a man-made environment in the playground. Rakel (CT) argued: 'We have had a discussion about physics regarding the seesaw or the friction in the slide.'

The preschool teachers also mentioned many examples of how they used the natural environment to learn about nature and about children's own investigation of small animals, plants, water, sand, mud, and the weather. An example of this is what Anna (PT) told us about children's investigation: 'They find spiders and snails and put them in a box with a magnifying glass and we investigate them.'

Alda (D) said that the preschool teachers point out various aspects of the environment to children. For instance, when walking outside the playground the children 'observe their area and look for ... seasonal changes', and she added, 'We talk about the weather and investigate the weather. We talk about that each day.'

The preschool teachers also pointed out how they used the constructed environment outside to further children's learning about their home town, its history, and culture. As Frigg (PT) said, 'We visit the fish market, especially with the older children, because we are working on fish and preparing for the festival, The Constantly Happy Fisherman (I. Sjóarinn síkátí).' Other preschool teachers mentioned that they teach children traffic signs, names of places, and about different institutions in their municipalities. Hulda

(PT) also maintained that the five-year-olds knew more about their hometown than their parents because of regular field trips conducted with the children.

Included in this theme are teachers' ideas of how the outdoor environment supports children's play and learning in multiple ways. This is mostly about how teachers see the importance of experiencing the outdoor environment, both natural and man-made, can offer children for their play and learning.

Children's health, well-being, and courage

This cluster of themes includes how the teachers saw the role of the outdoor environment in furthering children's physical movements and well-being, as well as developing their ability to tackle risks and build up courage.

Both preschool and compulsory school teachers pointed out the importance of children's outdoor play to release extra energy. As Ingunn (CT) pointed out, after spending a whole morning outside with the children, that they were 'happy and tired ... and then they maybe sit and work on mathematics without a sound ... for two hours'. Many teachers of both school levels also mention physical movement and 'being out in the fresh air'. Some compulsory school teachers expressed concerns about children's lack of exercise and resulting weight gain. Many participants referred to the role of the school in encouraging children's physical exercise in the outdoors. Björk (CT) found such activity to be benefits of outdoor education since it was important for children's health. She said that this was something that teachers 'in the compulsory school have to begin to think about'.

The compulsory school teachers discussed the fact that taking the children outdoors is a way to create diversity in teaching and thus stimulate the children's interests; they saw this as a good way to meet the needs of children who 'find it difficult to sit for a long time and be in the classroom', as Ragna (CT) phrased it. Klara (CT) said:

I experienced it with a group of boys that were problematic inside. Outside they were not the same children. They just needed to have something to do ... fetching firewood, putting it on the fire and watching it. They need other things than the girls.

The compulsory school teachers also referred to the outdoors as a place for teaching children to 'be a good group' and solve problems among the children, or as Ingibjörg (P) said, 'There are often some conflicts in the school grounds that need solving.' In this way, the outdoors was seen as a learning place for good communication among the children and contributing to their well-being.

The teachers were not specifically asked about risks and dangers, but they were asked what could limit their use of the outdoors. Only one preschool director mentioned related risks, a topic which may have seemed particularly relevant in his case since this director was in charge of a school with regular field trips on the agenda. A few compulsory school teachers addressed risks in general, but did not see this aspect as limiting the use of the outdoors, though Klara (CT) mentioned it specifically as something that must be taken into consideration when going out with children. She said, 'There are some risks of accidents, for example, when we got the fireplace. If you are lighting a fire there have to be two grown-ups present. I would prefer this arrangement, if you have a whole class of children.'

The preschool teachers who mentioned risks in the outdoor environment addressed them more in the context of the need to teach children to tackle risks in the environment in order to build up their courage. Hekla (PT) said that the 'parents thought it was amazing how good the children were in traffic education ... they learned to know how to

avoid the dangers ...'. The teachers also noted that children wanted to challenge themselves and try out new things 'such as climbing on big rocks' or on the top of the play houses in the playground. Hekla (PT) argued that in society there is a trend to overprotect children, but she explained that 'there is a difference between protecting [the children by] wrapping them in cotton or ... letting them try out things'.

In this theme, we grouped together items teachers brought up concerning the importance of the outdoor environment for enhancing children's physical health. Teachers also noted that the use of the outdoor environment in teaching helps children to learn to interact with one another. Furthermore, they argued that the outdoor environment had a role in furthering children's self-esteem through learning to handle risks in their surroundings.

Children's views, and knowledge of, and actions towards sustainability

As mentioned earlier, all of these teachers worked on a project about SE so it was interesting to hear whether, and if so how, they connected SE to outdoor education. Almost all interviewees saw a strong connection between using the outdoors and SE. Half of them referred to these as almost synonymous, though they had some difficulties in explaining why and how; as Hildur (D) said, 'It is just one and the same, I believe.' When asked further, the teachers expressed the following reasons presented here in three subthemes: (a) getting to know the outdoors will help children respect it and foster willingness to protect it, (b) teaching children about their place in nature and how to use it in a sensible way, and (c) encouraging children's participation in society.

Getting to know the outdoors will help children respect it and foster willingness to protect it

Many teachers at both school levels said that taking children outside is a way of providing them with an opportunity to come into contact with nature and enjoy being there. These teachers saw it as fundamental and necessary to further children's environmental awareness, thereby encouraging them to respect nature and assist in its preservation.

When asked specifically about the connection between using the outdoors and SE, Freyja (D) argued, 'I had not thought about this connection directly. It is just being outside and enjoying nature. Yes of course that is what it is.' Birna (CT) said in this connection:

I think ... taking children on these trips and teaching them to enjoy things we have here all around us ... getting to know both plants and birds and ... geography ... then they will respect it more, respect nature.

Others said that this was obvious and would happen naturally. Ragna (CT) stated that if children experienced growing their own plants they would respect other people's plants, and Klara (CT) remarked that it is important to focus children's attention, for example, on the sounds of nature, to enhance their environmental awareness.

It was apparent that connecting sensual experiences, especially when they were positive, was in many teachers' minds a suitable way of encouraging children to be positive towards the environment. The teachers saw it as a necessary element in education for sustainability to learn by doing, thus building the ground experience for respecting the environment.

Teaching children about their place in nature and how to use it in a sensible way

Teachers of both school levels stated that the outdoors offered numerous opportunities to use environmental and social knowledge to teach children about their place in nature, as

well as how our behaviour can affect the environment and how we can make sensible use of nature and our surroundings.

Teachers of both school levels emphasised the importance of cleaning up garbage outdoors and teaching children not to litter. In this connection Inga (CT) summarised, 'You are always stressing that they should ... not throw things; they should pick up litter, and not ruin the moss'.

Ingunn (CT) connected using the outdoor environment and SE so as to help children see the relationship between man and nature: 'I went out with them ... and they were looking at the water and asked me, Can we drink this?' She argued that it is important for children to think about what happens to sewage from the community. She also said that if children are taught outside, it is easier to refer to shared resources like air and water which connect and concern all of us.

Another example of how the teachers connected the outdoors and SE came from Rafn (P), who discussed a Brent Goose project that the teachers and the children in the whole school work on each spring. In spring, the Brent Goose spend a few weeks grazing on the shores and agricultural land in the neighbourhood of the school, before flying to Canada for breeding. Rafn emphasised the importance of having opportunities in the neighbourhood that could further children's learning about our responsibility to secure a habitat for these birds and our international responsibility in protecting them.

Anna (PT) used when children take care of the animals in the playground as an example of how the use of the outdoors connected to SE. They 'find it very exciting to pick the eggs ... and we also have compost and things like that'.

Teachers of both school levels pointed out the importance of learning about their community, although the preschool teachers emphasised it more strongly. Freyja (D) said that she thinks, 'SE involves many things. Culture and ... connecting with the community and ... we do lots of visits to institutions'. She continued to discuss the importance of children learning about the special characteristics of their municipalities.

This theme comprises teachers' ideas about how the outdoor environment can offer opportunities to build children's knowledge. Thus encouraging them to reflect on how we should behave in a sustainable way and how important nature is to our lives as well as other organisms.

Encouraging children's participation in society

Participation in society, where children could have some impact on what happens or see them self as actors of change, was also considered important in SE. Children's outdoor experience gives them diverse knowledge about their surroundings, which can be valuable for decision-making about the outdoor environment. Kolfinna (CT) used the example of planning footpaths; the children know where it is best to walk and, therefore, where footpaths should be placed. Participation in decisions about their own environment, for example, the school grounds, was also seen as important and three of the schools worked on a project about this subject.

Hekla (PT) noted that in regular fieldtrips with the children they loved walking by the seashore and watching the sea. When the municipality built a barrier at the seashore the children could not observe the sea any more. The children and teachers discussed this and decided to suggest a platform where, you could go up on the barrier and look out over the sea. The children made drawings of the platform and took it to a meeting with the town's mayor. The mayor liked their idea; about a month later the platform was there and they could see the sea again. Hildur (D), in the same preschool, made the point that

if you are going to teach children to participate in society you have to take them outside, especially outside the playground.

This theme comprises teachers' ideas of how the outdoor environment offers opportunities to participate in society. Children get to know the environment and therefore they are knowledgeable about it and can come up with ideas which may result in environmental changes. This can further their action competence.

Discussion

This study investigates 25 Icelandic teachers' views about the role of the outdoors in children's learning. All teachers had used the outdoor environment in their teaching, and they valued the positive educational potential more than the possible risks that could be involved in taking children outside. It was interesting that most of the teachers at both school levels referred to the outdoor environment beyond the schoolyard or playground when discussing their own teaching or planned activities with children. They seemed to view the schoolyard and playground as places mostly for children's own free play and inquiries, and it was obvious that teachers at both school levels saw this as important for children's learning. This supports a Swedish study in which the compulsory school principals saw the school grounds mainly as a place for play rather than a place for teaching (Björklid 2005).

Regarding how the teachers saw the role of the outdoors as important in children's play and learning they highlighted the importance of children's sensory experience of various phenomena that cannot be found inside for their learning in accordance with experience-based theories (Dewey 1916/1966; Jordet 2010). The teachers also made the point that they teach children names of things and places as well as talking about what they experienced outside. This is consistent with theories that emphasise the importance of communication for the learning process and that some things, we can only learn from others (Vygotsky 1978). Furthermore, these results support conclusions from other studies to the effect that teachers find combining communication and children's experience of the physical environment important in their learning (Herrington 2008; Jordet 2010; Magntorn and Helldén 2006; Szczepanski and Dahlgren 2011).

The participants also saw the outdoors as having a role in furthering children's health and well-being, which thus supports findings from earlier research that teachers see the outdoors as important for children's physical health and well-being (Björklid 2005; Davis 2010; Ernst and Thornabene 2012; Szczepanski et al. 2006). The compulsory school teachers stated that children are spending increasing time indoors and argued that the school should react against this development. They further, emphasised the health-improving effects of the outdoors such as clean air and possibilities for physical movement. The compulsory school teachers saw using the outdoors as a way to increase diversity in their teaching, which would help them to meet the needs of all children. This is consistent with Szczepanski and Dahlgren's (2011) findings of how teachers see the opportunities of outdoor education. Thus, using the outdoors helped the compulsory school teachers to look at children's learning and overall development as something they could work on simultaneously and also to accommodate the needs of all children. On the other hand, the preschool teachers did not mention using the outdoors to increase diversity in their teaching; indeed they seldom spoke of what they did with children as 'teaching'. In contrast, they saw outdoor play as part of the daily routine. This supports research findings about preschool teachers in Scandinavia seeing playing outdoors as something that is part of children's everyday experience

in preschool (Björklid 2005; Moser and Marinsen 2010; Szczepanski and Dahlgren 2011).

The finding of this study regarding how the teachers viewed the possible risks of children having accidents in the outdoor environment was interesting. They seemed to think about this as something they had to take into consideration but did not see it as a hindrance. These Icelandic teachers valued the educational potential of the challenges the outdoors offered children to build up courage more than they feared the possible dangers of taking children outside. This is in step with findings from Norway (Sandseter 2012) and conclusions about how teachers there and in Sweden regard risk concerning children and the outdoors (Magntorn and Helldén 2006; Sandseter 2012). However, these findings are in contrast with the fear for children's safety that seems to hinder teachers in many other countries from taking children outside (Ernst and Tornabene 2012; Kernan and Devine 2010; Little, Sandseter, and Wyer 2012; Rickinson et al. 2004). Viewing children's outdoor play and learning so positively may be something special to the Nordic countries. This view probably has to do with the culture of outdoor life in these countries (Waller et al. 2010) and the low threat of lawsuits in case of accidents.

The participants in this study also saw the role of the outdoor environment to further children's views, knowledge, and action towards sustainability. As mentioned before, these teachers were participating in a project about ESD, and this background gave them a new perspective on the use of the outdoors. This was valuable for our understanding of the possible role of the outdoor environment in children's learning, so it did not come as a surprise that these Icelandic teachers connected the use of the outdoors with ESD. Even though, some teachers used the terms outdoor education and SE synonymously in the beginning of the interviews and had difficulty explaining why, some seemed to realise that environmental awareness is not something that happens automatically, as Rickinson et al. (2004) argue that many teachers believe. When asked further, it appeared that the teachers connected the use of the outdoors and SE in three ways. Two of those are well known: first, that experience of the outdoors helps create positive attitudes towards nature, as can also be seen in the literature (Chawla 2007; Davis 2010; Louv 2010); and second, that the outdoor environment is well suited to learning about the place of man in nature, which can help to improve man's behaviour in nature (Ärlemalm-Hagsér 2013; Davis 2010; Fägerstam 2012, Szczepanski and Dahlgren 2011). The third way that the teachers connected the use of the outdoors and SE had to do with children's participation in their community. The teachers gave examples of how using the outside provided children with opportunities to participate in and affect their environment and community. Some claimed that this was something they found hard to do without going outside the playground. These examples indicate that an increased emphasis on participation in educational projects regarding the environment does not have to cause a loss of children's outdoor experience, as Sandell and Öhmann (2010) argued. On the contrary, these findings support the recommendations of scholars that the outdoors be seen as a place for children's participation in society, offering them opportunities to be actors of change and thus learn how decisions are made (Ardoin, Clark, and Kelsey 2013; Ärlemalm-Hagsér 2013; Greenwood 2013).

The findings of this study contribute to the growing field of research about how teachers in various socio-cultural contexts see the opportunities of using the outdoor environment in children's learning. These teachers show us how the outdoors can be used as a diverse learning environment. The focus is not only on the experiences the outdoors provides to further play and learning and the improvement of health and well-being the outdoors can offer; but this study also contributes to our knowledge about the connection to SE. These findings reveal that the outdoors can offer opportunities for children to become visible in the

society and offer children opportunities to experience themselves as actors of change in the society by participating in it.

Conclusions

The findings of the study indicate that the Icelandic teachers who participated in the study valued the educational potentials of the outdoors much more than they feared the possible dangers children could be exposed to. These teachers saw diverse opportunities of the outdoor environment for children's learning, not only as a place for stimulating their play, learning, health, and well-being, but also as a place that could affect children's views and action regarding their environment in a sustainable way.

Among the most important implications of this study for school curricula is that many outdoor places afford opportunities for children's learning beyond that which can be done indoors. According to the teachers, these places offer different experiences that children could learn from directly, or these experiences can be used as grounds for discussions that are important for children's learning in many subject areas. This is something that teachers of all school levels can take notice of in their teaching and use the opportunities the neighbourhood offers for children's learning. This should also be considered when schools and their surroundings are designed.

Another important implication is to consider whether these findings may focus attention away from the potential risks and dangers connected to the outdoors. The risk discourse seems dominant in relation to using the outdoors in the school curriculum in many countries. Of course, it is important to be aware of the dangers children can face outdoors and take proper precautions to avoid them. Nevertheless, it is important to note the importance of providing children with an opportunity to tackle such dangers instead of avoiding them. Thus circumstances that some teachers may find dangerous can be used to further children's self-esteem and courage.

The third implication of the study that we wish to draw attention to concerns how the outdoors can be used in ESD. These teachers' experiences in an ESD project gave them opportunities to connect ESD and the use of the outdoors in children's learning, something that is of value for the design of the school curricula. Teachers' views of how experience and knowledge gained outdoors could affect children's views and action regarding their environment in a sustainable way. Also important are teachers' views about the outdoors as a place for children's participation in society, where they can experience themselves as actors of change. This approach to school curricula can help to make the school a part of the society – as well as help to build a sustainable society.

It would be of interest to follow up some of the findings in this study, such as how the teachers saw the connection between indoor and outdoor learning and how they consider the role of the schoolyard or the playground in their teaching. Why teachers in some countries are more afraid to take children outside than those in other countries also needs further investigation. This would make it possible to better understand what causes such difference and which social phenomena cultivate an atmosphere of fear in some countries more than others.

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Article 3

Children's views and preferences regarding their outdoor environment

Children's views and preferences regarding their outdoor environment

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This study aims to enhance awareness of what young children want to do outside and their preferences regarding their outdoor environment. Views of children as active participants, the affordance of the environment and the importance of place for children's learning constitute the theoretical background of the study. The study was part of a research and development project on education for sustainable development in which preschool children and compulsory school children participated in decision-making about how their common school ground should be constructed. Data were gathered through observations and interviews with children and teachers. The findings show that the children wanted to challenge themselves as well as to be secure, explore things, be in contact with others, find or create nests and enjoy beautiful things outdoors. The children highly valued the natural environment and liked diversity in playground equipment.

Keywords: school outdoor environment; young children's views and preferences; participation; children's perspectives

Introduction

In Iceland, most children aged two to five spend eight hours a day or more in preschool (Statistics Iceland, 2011). At the age of six, children begin compulsory school, and many of them attend after-school programmes (Pálsdóttir & Ágúsdóttir, 2011), usually located in the schools or in buildings within the school grounds (The City of Reykjavík, n.d.). In Icelandic preschools, children typically play outside for at least one hour daily in all types of weather. In the compulsory schools, on the other hand, children's outdoor playtime is usually limited to recess periods, the longest ones generally lasting about 20 minutes, and occasional outdoor lessons. However, children can play in the schoolyard as part of after-school programmes.

Schoolyards at Icelandic compulsory schools usually contain playground equipment, spaces for ball games and large flat areas with little vegetation. The yards are not usually fenced. Outdoor areas at preschools, however, are generally enclosed with a fence and have more vegetation; more thought is also given to opportunities for children's play and learning.

Keeping this in mind, one can say that nowadays schoolyards and playgrounds constitute the outdoor environments most familiar to young children; it is therefore important to consider carefully what kinds of experience these environments may offer. One way to address this is to find out what children, who are the most frequent users of these environments, have to say about them. This article focuses on children's interests

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regarding the activities they want to do in their school and preschool outdoor environment, and the kinds of environments they prefer for such purposes.

Background

The first author's background as a biology teacher and interest in whether young children want to use nature in their play and learning, as well as how they wish to do so, have influenced the choice of topic and how the data are interpreted. The study was part of a research and development project on education for sustainable development (ESD). According to UNESCO, the aim of ESD is:

... to help people to develop the attitudes, skills, perspectives and knowledge to make informed decisions and act upon them for the benefit of themselves and others, now and in the future. ESD helps the citizens of the world to learn their way to a more sustainable future. (UNESCO, n.d.)

This study is thus influenced by the view that it is important to involve children in decision-making about their environment. The study was conducted as a part of a school project where teachers worked with children on what kind of opportunities they wanted their school ground to offer and how they wanted the environment there to be. In this way, their attention and interest were focused on their local environment and also that they themselves could affect how it would be designed. ESD holds children's participation in projects regarding their local environment to be important. Emphasis is placed on children's participation in decisions relating to the environment, encouraging them to act on their decisions about their experiences in ways that are connected to their own well-being and to that of others (Breiting, 2008). Årlemalm-Hagsér (2012) points out that the most important element of ESD is children's participation, especially their opportunities to experience themselves as agents for change. This provides children with the potential to discover that they can affect their environment and thereby exercise their influence in the community.

According to the Icelandic Act on Preschool Education (No. 90/2008) and the Act on Compulsory School Education (No. 91/2008), the role of schools is to prepare children for participation in a democratic society. Thus, this study is also influenced by the view of children as capable, competent and active thinkers who have something special to offer and from whom grown-ups can learn (see, e.g., Clark & Moss, 2001; Dahlberg & Moss, 2005; Einarsdóttir, 2007; Harcourt & Einarsdóttir, 2011; Schiller & Einarsdóttir, 2009). The Convention on the Rights of the Child (United Nations, 1989, 2005) has changed the way people look at children, stressing their right to participate in decisions about their own lives and circumstances. Children are seen as citizens with their own rights, rather than as future citizens (Einarsdóttir, 2012). Although all grown-ups have experienced childhood, their experiences differ from those of today's children (Perry & Dockett, 2011). Children are therefore seen as the most knowledgeable about what it is like to be a child today and about the environment they live in (Clark & Moss, 2001). However, involving children in decision-making is not without difficulties. Sheridan and Pramling Samuelsson (2009) point out, for example, that children's opportunities to participate in decision-making depend on adults' views toward children, knowledge, learning, understanding and experiencing. Children differ, and what they find important also differs—they present a multiplicity of voices, rather than a singular viewpoint. Researchers working with children have to consider whether they are listening to some children more than

others (Einarsdottir, 2012). Children's views can also change over time and in different contexts, as Warming (2005) has pointed out. Many other concerns and questions about children's participation in research and decision-making have been put forward. The empowerment rationale in which children are viewed as a minority group acting in their own interests has raised some questions. Listening to children involves more than just listening to what they have to say; it also includes taking them seriously and acting upon their voices (Brooker, 2011; Einarsdottir, 2012). Percy-Smith and Thomas (2012) have pointed out that children's participation is often seen as an involvement in changes, but that the outcomes of those changes are stressed instead of the process of participation. Percy-Smith (2010) also suggests that we need to find ways for children to participate in and interact with their everyday environment to help them feel empowered. Kjörholt, Moss, and Clark (2005) have critiqued the manner in which listening to children is inscribed in rights discourse. They caution that two opposing images of the child may result: as vulnerable and dependent or as autonomous and competent. Further, Mannion (2007, 2010) points out that children are dependent on adults in their participation and decision-making; we should recognise this and look more closely at the relationship between children and adults.

The study is also influenced by theories that emphasise the importance of the learning environment; that is, the place for children's learning. The place is here seen as demarcated, large or small, part of the outdoor environment in the neighbourhood of the school. Children are always somewhere, in some kind of place, and that place affects them. They experience places on their own terms and learn from them, and the places may affect children's identity and relationships (Gruenewald, 2003). As such, the places themselves are considered a product of our culture, or as Greenwood (2013, p. 93) puts it: '... places can be thought of as primary artefacts of human culture—the material and ideological legacy of our collective inhabitation and place-making.' Thus, places are seen as having both physical and ecological qualities, as well as being regarded as social constructions (Gruenewald, 2003).

The study draws on Gibson's (1979) theory of affordance in collecting and analysing data about children's ideas of what they want to do in the environment. Gibson (1979) saw people's actions mainly as their interpretation of what the physical environment has to offer, or the affordance of the environment. The affordance also depends on the ability of the person involved, so the affordance of the environment does not need to be the same for an infant, a school child or an adult. Obviously a tree can afford a school child to climb in it, if the child finds it climbable. And a tree may also afford a toddler to creep under it, if the toddler determines that it can do so. Gibson's affordance theory is thus about the interaction between people and their environment.

Previous research

In recent years, the body of literature studying young children's views and preferences regarding the outdoor environment has grown. Research projects in which children have participated in schoolyard or playground designs have yielded important information (Clark, 2007; Clark & Moss, 2005; Dymont, 2004; Malone & Tranter, 2003; Titman, 1994). One such study (Titman, 1994) indicated that children see the school playground as part of the school; unlike teachers, who often restrict their definition to the school building itself. Studies have also shown that children like to be outside and want to spend more time outdoors (Clark & Moss, 2005; Malone, 2006; Stephenson, 2003), and that outdoor areas are the most popular places in schools (Burke, 2005; Einarsdottir, 2005a, 2011).

Regarding what children want to do outside, some research findings show that they enjoy opportunities for physical movement (Clark, 2007; Fjörtoft, 2000; Kernan, 2007; Waite, 2007) as well as circumstances where they can challenge themselves (Little & Eager, 2010; Sandseter, 2009; Titman, 1994) or do scary things outside (Stephenson, 2003). Sandseter (2009) found that both ordinary playgrounds and natural surroundings used as playgrounds provided many opportunities for preschool children to engage in risky play, although natural surroundings involved a higher degree of risk-taking than ordinary playgrounds.

Research studies allowing children to choose between natural or constructed outdoor environments have revealed that children prefer natural environments to constructed ones (Lucas & Dymont, 2010; Malone & Tranter, 2003; Titman, 1994; Waller, 2006), since they like to be in contact with natural phenomena such as water, animals and plants (Burke, 2005; Clark, 2007; Kernan, 2007; Malone & Tranter, 2003; Mårtensson, 2004; Titman, 1994; Waller, 2006). Natural environments have also been found to offer more diverse play opportunities than traditional playgrounds (Fjörtoft, 2000; Moore & Wong, 1997; Tranter & Malone, 2004). Thus, it is not surprising that such environments appeal to both boys and girls. Lucas and Dymont (2010) found that a natural area in a school playground was the only place where equal numbers of boys and girls chose to play. Findings from a study of the views of children 6–11 years old on public playground design indicated that if children had access to a natural environment near the playground, the design of the playground was not as important (Jansson, 2008). Several scholars have asserted that good experiences with nature and emotional attachment to nature in childhood motivate people to respect the natural environment later on and take action to preserve it (Louv, 2005; Sobel, 1996; White, 2004; Wilson, 1995), and several studies have supported this (Bögeholz, 2006; Chawla, 1999; Wells & Lekies, 2006).

The outdoor environment also consists of the people who are there. Children desire and enjoy contact with other children (Clark & Moss, 2005; Einarsdottir, 2011; Perry & Dockett, 2011) and grown-ups, and it is well known that good places for communication in the outdoors are important (Clark, 2007).

Research results indicate that children like to make certain places ‘their own’ (Änggård, 2012; Fjörtoft, 2000; Kernan, 2007; Kylin, 2003; Waller, 2006), where they can relax without interruption (Clark, 2007; Einarsdottir, 2005b; Titman, 1994), spend time with friends (Kylin, 2003; Titman, 1994) or gain an overview of their surroundings (Kernan, 2007). Malone and Tranter (2003) found that elementary school children played outside mostly in small groups and less frequently in large groups, and big open spaces were not used as much as small spaces.

The present study adds to previous research in at least two ways. First, the research study was part of a project in which teachers worked with children to find out how they wanted to construct their outdoor environment. In other studies in this field (e.g., Burke, 2005; Clark, 2007; Kylin, 2003; Malone & Tranter, 2003; Waller, 2006), the emphasis has mainly been on listening to children about their views and preferences with regard to the outdoors. This study added the voices of teachers who were in daily contact with children, focusing on how children talked about what they wanted to do outside and observing how they used their outdoor space. Second, the study contributes to existing knowledge about children's views on the outdoor environment in Nordic countries, where outdoor play is highly valued (Halldén, 2009). The following research question guided the study:

What are children's preferences about outdoor activities and surroundings in the outdoor school environment?

Methods

Participants and research setting

The study was conducted in one primary school and two preschools in Iceland that participated in a research and development project concerning children's participation in the design of the school grounds held in common by the three schools.

The three schools are all located close to each other in a small municipality near the capital city of Reykjavík. The preschools had their own playgrounds with play equipment, sandpits and plants. One of the preschools also had domestic animals (rabbits and hens). At the compulsory school, only part of the schoolyard had been completed and the majority of it was covered with rough gravel. In all three school grounds, hills of varying sizes had been constructed. Before the project began it was decided to transform a parking lot located between the compulsory school and one of the preschools into a playground for the children in those schools. The schools are located in an area containing several drainage ditches.

The project examined children's ideas about their outdoor environment and how they would like it to be organised. At both school levels, teachers presented examples of different kinds of environments to the children to increase their knowledge of various outdoor situations. The teachers did this in different ways, by showing the children pictures of other schoolyards and playgrounds, diverse constructions and outdoor sculptures, and by taking them on trips to investigate different environments. Children's ideas were discussed and they also expressed them through drawings, sculptures and models of school grounds. During the project, the teachers listened carefully to the children and wrote down their ideas. They also collected children's drawings and other artwork. At the end of the project, an exhibition was held to present the children's ideas to all of the children in the schools, their parents, representatives of the local authorities and the architect who had been hired to design the school grounds.

Participants in the development project, and therefore also in the study, were 100 four-year-old and five-year-old children from the two preschools (75 from one and 25 from the other) and 189 six-year-old to nine-year-old children from the compulsory school. Out of this group, 16 children were selected to participate in interviews about their views of the outdoor environment. Measures were taken to ensure age and gender balance in the group. The teachers selected the children and were asked to select children with various interests and from different neighbourhoods to ensure that students had experience with different outdoor environments. Eight preschool children aged four and five participated in the interviews, two boys and two girls from each year. Also participating were eight primary school children aged seven and nine, two boys and two girls from each year. In the preschools, five preschool teachers who worked with the children in the project, as well as the directors of both schools, were interviewed, for a total of seven interviewees. Ten primary school teachers who had worked on the project with children were interviewed, as well as their principal; in total, 11 interviewees.

Data gathering

Multiple methods were employed to elicit children's preferences about outdoor activities and the environment of the school grounds. The methods included interviews with the children and teachers, walking tours conversations with the children, meetings with teachers and classroom observations.

The eight interviews with the 16 children were conducted at the beginning of the project in order to gather data about what children liked in their environment. The children

were interviewed in pairs in order to counteract the power inequality between the researcher and the children and to make the children feel comfortable (Alderson & Morrow, 2004; Brooker, 2001; Einarsdóttir, 2007). The interviews were semi-structured (Greene & Hill, 2005; Lichtman, 2010) and took from 15 to 20 minutes. After the interviews, the children (in pairs) led a walk through the playground for 15–35 minutes. This provided opportunities for more conversation with the children in a different environment (Clark & Moss, 2001).

Participant observations (Lichtman, 2010) were carried out in the classrooms and with groups of preschool children while the children worked on the project of designing their school yard. Each class and preschool group was visited from one to four times for a total of nine hours of visits. The teachers were interviewed at the end of the project for the purpose of obtaining their views on children's preferences concerning the outdoor environment. Four individual interviews and four group interviews were held, ranging from 40 to 80 minutes each. During the project, 10 meetings were held with the teachers, and the researcher's notes from those meetings were also used as data sources. During the meetings, teachers often referred to the children's work in the project.

Data analysis

In analysing the data, the intention was to investigate the diversity of children's views and preferences about the outdoors or the affordance of the environment. We therefore tried to keep an open mind and see what would emerge from the data. A six-step thematic research analysis method described by Braun and Clarke (2006) was used in this process. First, all of the interviews with the children and teachers, the walking tour conversations, the meetings with the teachers and the observation notes were transcribed. Next, the transcripts were read many times and coded according to the research question: that is, how the children wanted to use the outdoor environment and how the children wanted the environment to be as a result. In this step, the data were coded by hand. The third step was to find potential themes from the codes—a concept map was helpful in this process. Having reviewed the relevant literature, we expected to find certain themes, but at the same time tried to keep an open mind in the event that something else might appear. The fourth step involved reviewing the themes to see whether they worked in relation to the coded text. The fifth step consisted of clearly defining the themes and giving them names, and the last step involved writing a report about the findings.

Ethical issues

The study was introduced to all of the children's parents and they were asked to let us know if they did not want their children to participate. The local authorities gave permission for the study. The compulsory school principal and the preschool directors, as well as the parents of the children who were selected for interviews, gave their informed consent. The study was also reported to the Icelandic Data Protection Authority.

The children who participated in the research were asked whether they wanted to participate. However, it can be difficult to obtain informed consent from young children, because they may not always understand what they are agreeing to participate in and what consequences it may have for them (Dockett, Einarsdóttir, & Perry, 2009; Harcourt & Conroy, 2005). At the beginning of the interviews with the children, they were asked whether they wanted to participate in the research and were told that their identities would be hidden in any presentation of the research. It was also made clear to the children that

they could quit the interview whenever they wanted. Prior to the school observations, the children were told what the research was about and asked whether they had any reservations about being observed and having their pictures taken. All the children wanted to participate and many were very surprised and quite disappointed to hear that their names would not be used in the presentation of the findings. They seemed happy and proud to participate in the research and wanted to be recognised.

When participants are quoted, we use pseudonyms and refrain from giving detailed descriptions.

Findings

The study revealed that most of the children who participated in the study seemed to like being outside and preferred it to being inside. The children liked to have diverse opportunities in their outdoor environment for different types of play. The following themes emerged from the data about the affordance of the environment in children's ideas: *physical challenge* was important to children, but they wanted to *be secure* as well; they liked to *explore* things; they wanted to *be in contact with others*; they liked to create or find a *nest* for themselves; and they *enjoyed beautiful things* in the outdoors.

Challenge versus security

Moving around and doing things that involved physical challenges seemed important to the children, but so was their wish to be safe in the outdoors. They talked about physical challenges like climbing trees and challenging themselves on the play equipment. Jakob, age five, said for instance that he liked to 'bicycle up the hill ... and then just *sbrr* downhill' ('*sbrr*' means to speed downhill). Magnus, age four, liked best 'to play on the roof' (of the playhouses).

Anna and Bjork, four years old, showed the researcher in their walking interview how much fun it was to bump into one another on the swings and turn very fast in the carousels.

In the project, the teachers' focus was drawn to children's preferences for the outdoors. In a meeting, the preschool teachers indicated that during the project the teachers had changed their attitudes about what children should be allowed to do outdoors. They had started to reconsider which rules were necessary and which were not. Teachers saw that allowing children to challenge themselves was valuable enough to outweigh the possible risk of minor accidents.

Helga, age nine, said: 'I enjoy the carousel best. Sometimes it makes you sick but it is such fun.' Harald and Johann, age seven, were enthusiastic about amusement park equipment they wanted to have in the playground, and favourably mentioned equipment like 'a ghost room', 'lazer tag', 'a climbing wall' and 'a water slide'. Many children mentioned that they liked the play equipment in the playground, and would like to have more of it and more diverse varieties. Play equipment was very prominent in the project at both school levels. The primary school children emphasised that they wanted a bigger hill in the school grounds to slide on when there was snow.

All of the primary school children said they liked to play by the drainage ditches—even though they mentioned being afraid of them. One teacher of six year olds said that two girls repeatedly came back wet after playing in the ditches outside the school grounds—they apparently liked it a lot, she said. Hence, the teachers seemed to understand children's longings to play in the ditches, but were also well aware of the dangers. They had allowed

the children to play in small pools in the hill area instead of in the ditches, because, as one of the teachers said, 'the children cannot drown there'.

Some of the primary school children mentioned things having to do with outdoor security. Harald, age seven, said that he wanted the rough gravel on the ground replaced with grass so the children would not hurt themselves. Helga, age nine, said 'then we also need more shelter' from the weather. Nine-year-old Maria said she wanted, 'a colourful strong fence around the ditches ... because there is always someone playing there ... and in the end someone falls in'. The teachers of the seven year olds also noted that the children had said they wanted a fence around the school grounds like in the preschool. Another example of children's longing for security was expressed by Helga and Maria (age nine) who wanted more adult supervision in the playground—to help in case of conflict and accidents, especially near the drainage ditches.

Exploring

Children's desire to explore the outdoor environment was another theme that evolved from the study. This involved children collecting, investigating, creating and finding out what to do with things. When asked what she liked to do outdoors, Inga (age five) said 'picking leaves', and in the walking interview the five-year-old children showed the researcher the bushes in the playground where they liked to pick berries. The preschool children were interested in investigating small creatures they found in the school grounds. In the walking interview, Baldur and Jakob (five year olds) showed the places where they could find bugs in the playground:

Jakob: There are lots of spiders there, ... Under here—found you! [He said to the spider he found.]

Jakob: Some are small and some are big,

Baldur: And some are in the middle.

Jakob: Here little, little cute one.

The seven-year-old girls in primary school mentioned in the interview that they also liked small bugs:

Freya: I like it when the weather is good and we go out walking—then I always pick snails in a box.

Researcher: What do you do with them?

Freya: We train them and things—play with them ... we are in a sort of snail club.

Researcher: Did you learn anything about the snails?

Gudrun: They die if they don't get anything.

Freya: Something like grass. Sometimes I take a bottle lid and put a little water in it and hold the snail and let it drink out of the lid.

The primary school teachers (of the six-year-old children) stated that there is always a certain group of children who like to investigate the environment and are interested in nature. One teacher said: 'It is quite apparent they are collecting insects and all kinds of flowers and different kinds of shells in the sand. We need a little area for more exploration of nature, especially for these children.'

The preschool children did not mention water in their interviews, but as part of the project they made drawings of waterslides, ponds and waterfalls, as well as areas with mud to play in. Many of their teachers talked about how the children enjoyed playing in

puddles that emerge on the playground after heavy rain and stressed that water play was very popular among the children, including playing with water in the solid forms of snow and ice.

All of the primary school children talked about how they liked to play around the ditches outside their schoolyard, as mentioned before, and many of their teachers described how the children liked to wade, paddle and play with the mud in the bottom of the ditches, making blockages and bridges and trying to catch the tiddlers that live there.

Creating things seemed important to the children, and materials such as sand, mud and branches from the trees in the yard were popular. Some of the seven year olds said they wanted to have opportunities to build things out of wood:

Harald: I like to, you know, sometimes to get some piece of wood. Maybe we will do that when we are going to build that hill or something.

Helga: [We] can maybe put one piece of wood on the hut and write 'Pizza Hut', and another stick on the other hut and write 'The Bakery' or something. Build a kind of town we can always play in.

Their teachers described how the children enjoyed playing with sticks and making things from them, or hiding a stick they had found and asking the teachers to look for it. As Marta, a teacher, said: 'One stick can be like gold to them'.

Being in contact with others

The findings indicate that interacting with other children, grown-ups and other living beings was important for the children. Although some of the children sometimes wanted to be alone, most often they wanted to be with two to four friends, or sometimes join larger groups. Helga, a nine year old, talked about equipment that would encourage interaction among the children, like big swings where many could play together. She said: 'There the children could also blend—you know, because it would be such fun to climb into the swing and then the kids would mingle'. Both nine-year-old boys, Sigurd and Olaf, stressed that they liked ball games best, such as football and basketball, where they were part of a group and interacting with other boys. Harald, age seven, stated this clearly:

I would like us to play more all together outside. Like in *skotbolti* (a special kind of ball game which involves children throwing a ball at each other) or something—and we would not just have one ball, we would have many balls. Yes, just all second year would join, just in *skotbolti*.

Bjork (age four) and Baldur (age five) said that they wanted the grown-ups to participate in their play. The preschool teachers mentioned in a meeting that in the school project the children came up with the idea that the school grounds should be a centre of the community, for handicapped people and for people of all ages; there should be benches for older people and areas for animals.

The children whose preschool playground contained animals (rabbits and hens) said they liked to pet the rabbits and feed the animals, although some of the children were a little afraid of the hens. The teachers said that children's involvement with the animals differed. Some children were drawn to the animals, while others just liked to watch them.

Many of the children at primary school were also interested in animals. Helga, a nine year old, said she wanted to have animals 'like the ones in the preschool' but 'mainly I would like to have sheep and horses'. The seven-year-old girls said they wanted to build an environment for animals. Gudrun said:

I would like to have a ditch with fish. Then we would always in the summer go with a pocket net and catch some fish, and maybe someone would bring an aquarium we can keep the fish in.

She continued that she wanted to have a pond with ducks and then 'we can have a box filled with bread that we can give them'.

Children at both school levels wanted to be in contact with plants, especially trees, grass and other flowering plants, and these were often part of the drawings, paintings and models they made in the project.

Creating or finding nests

The children liked to find or create places that somehow separated them and their play from their surroundings. Often these kinds of places were intended for just one child or a few children. The primary school teachers mentioned that the children had found themselves a kind of nest, where they played in the high grass. This metaphor of the 'nest' is suitable, because these places were sometimes like the woven nests that thrushes make, sometimes like the holes puffins make and sometimes like a falcon's nest, offering a wide view of the surroundings. The preschool children liked their 'wood' for many reasons, one of them being that it created a place for them to play. According to the teachers, some children called it their 'secret place'. In the walking tour conversation, Jakob (age five) said he liked the area because 'you can stand in here . . . there are tracks here' and it's 'all so nice'.

The seven-year-old girls showed the researcher their 'secret place' under a house beside their school. Examples of nests that were open with a view were those on top of the hill. Simon, age seven, said that he liked to be alone on the hill and 'lie there and look up in the sky or sleep'.

Enjoying beautiful things

Children's desire to have beautiful things in their outdoor environment was another theme evident in the data. In the preschool, the five-year-old boys noted in the walking tour conversation that they did not like litter in the playground. Magnus, age four, talked about the 'need to enjoy nature'. Baldur, age five, said he liked the wood 'because there are so many leaves' and he liked the leaves because they were 'green and yellow, so nice'.

The primary school children mentioned that they wanted to have statues in the playground in various forms (e.g., spacecraft, parrots, a talking squirrel, a skeleton and a unicorn). Laura, age nine, said: 'I think the schoolyard should be more colourful. . . . Yes, with brighter colours.' In the walking tour conversation she added that it would be nice to paint flowers on the school building so it would not be so grey. One of the teachers of the six year olds said that, in her class, the children had emphasised that the schoolyard should contain many colourful flowers.

Discussion

This study was conducted in a small community in Iceland where preschool and primary school children participated in the design of a common school ground as part of a project in sustainability education. The data were gathered from interviews with the children and their teachers, as well as participant observations and meetings with teachers. The findings indicate that the children who participated enjoyed being outside, which is consistent with previous research (Burke, 2005; Clark & Moss, 2005; Einarsdóttir, 2005a; Malone, 2006), indicating that young children in different countries share this wish. This is an important message in a world where in recent decades many are concerned about children's reduced opportunities to play outside and explore their surroundings (e.g., Bögeholz, 2006; Louv, 2005; Malone & Tranter, 2003).

The children who participated in the study wanted to use their outdoor environment at school in various ways: they wanted to challenge themselves as well as to feel secure, explore things, be in contact with others, find or create nests and enjoy beautiful things.

The children's desire to physically challenge themselves is well documented in other research findings, which indicate that risk-taking is important for learning about and managing the world (Little & Eager, 2010; Sandseter, 2009; Stephenson, 2003; Titman, 1994). However, the findings of this study differ from other studies addressing children's risk-taking, where their feelings of security are seldom mentioned. Icelandic primary school children's wish for grown-ups to secure their safety in risky circumstances can be interpreted as a desire to take risks, but under the guidance of adults. This indicates the importance of finding a balance between allowing and encouraging children to try out new things and take risks, and at the same time ensuring their safety. This accords with contemporary views of children as strong and capable but at the same time also vulnerable and in need of protection (Kjørholt et al., 2005).

Children's interest in exploring various aspects of the outdoors, such as living beings, water, sand, mud and sticks, and finding out what they can do with them, is congruent with other studies (Clark, 2007; Kernan, 2007; Malone & Tranter, 2003; Titman, 1994; Waller, 2006). This can be seen as a contrast with reality, since the compulsory school outdoor environment is often covered with concrete and offers little if any experience of natural phenomena (Lucas & Dymont, 2010).

Children's preference for being with other children and grown-ups raises the question of how the outdoors can support social interaction between children, as well as between children and grown-ups. This has also been found in other research (Clark, 2007; Clark & Moss, 2005; Titman, 1994). Additionally, the children in this study were inventive and came up with different ideas of play equipment that they thought could encourage and give opportunities for interaction. It was also interesting to see that the children presented ideas which can be interpreted as a critique on the very idea of the school ground as a place for only children and teachers. Hence, the school ground as a place for all people in the community to use for being together and also for being in contact with other living beings.

Children at both school levels favoured natural phenomena in the outdoor environment such as plants and animals, as well as variation in the landscape, as has been identified in previous research (Clark, 2007; Clark & Moss, 2005; Kernan, 2007; Mårtensson, 2004; Titman, 1994). The natural environment increases opportunities to learn about nature and natural phenomena. Research findings have indicated that good experiences in the natural environment form an important ground for respecting nature and wanting to take action to protect it (Bögeholz, 2006; Chawla, 1999; Wells & Lekies,

2006), which is an important part of education for sustainability. However, many of the Icelandic children who participated in this study also wanted to have diverse types of play equipment and other man-made environmental elements on their playgrounds. The findings of this study indicate that diversity in the environment was important to the children, and thus emphasis should be placed on the natural environment in the design of children's outdoor surroundings at school, as well as on built elements. The findings from the study also indicate that the children liked to make or find 'their own places' or 'nests', which is in harmony with other research findings showing that having a place of their own or a place that encloses them and their friends is very important for children (Clark, 2007; Einarsdottir, 2005b; Fjörtoft, 2000; Kernan, 2007; Kylin, 2003; Malone & Tranter, 2003; Titman, 1994; Waller, 2006).

Fun and aesthetic pleasure are among the factors that the outdoor environment can provide. The study revealed that the children liked fun things, colours and beautiful objects in their outdoor environment. This is not often addressed in other studies, although Titman (1994) found in her study that children preferred places that were interesting, colourful and beautiful, thus offering emotional stimulation.

In this study, the children came up with many ideas of places that can be seen as a product of their culture (Greenwood, 2013). Examples of this are their wish to catch small fish in ponds in the ground and to feed the ducks, which is something children in Iceland often do. This study contributes to the growing field of research with children on their ideas about the outdoors in various socio-cultural contexts. Few studies have been done on how children want to use the outdoors and what kind of environment they want for that purpose. This study supports many of the previous research findings, showing that children in diverse environments and cultures like similar things outdoors. There are relatively few studies from the Nordic countries in this area. The study contributes to knowledge about Nordic children where children's outdoor play is highly valued and an important part of their daily lives.

The novelty of the study is also the research design. The study was conducted as part of a developmental project in which the teachers worked with children to design their outdoor environment, and focused on how children use and talk about their environment. The teachers contributed by offering additional information about things that the children had mentioned in the interviews or that were seen in observations, increasing the trustworthiness of the findings through triangulation. Sometimes the teachers also offered new insights about what the children wanted to do and what kind of environments they liked, and in that way advanced to a more comprehensive understanding of this. In addition, it was interesting to see how the project in this study affected some of the teachers, leading them to change their attitudes about what children were and were not allowed to do.

Listening to children involves more than merely attending to what they have to say; it is the adults' responsibility, when consulting children about something in their environment, to act upon their responses (Brooker, 2011; Einarsdottir, 2012; Perry & Dockett, 2011). But can we simply listen to children and then make changes that give them what they want? In decision-making, many interests and viewpoints have to be taken into account, including children's views. It is important to note that children's contributions can be diverse. In this project, the voices of the children were taken into account in the planning of the play areas. The parking lot was changed into a green play area, and the architect's design was influenced by both the children's and the teachers' ideas. However, in a project that aims to help children to understand that they can take part in society and be actors for change, as ESD emphasises (Ärlemalm-Hagsér, 2012; Breiting, 2008), the children also learn that decision-making often involves conflicts and compromises among

different stakeholders. However, importantly, they are included as stakeholders themselves.

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Article 4

Early childhood teachers' (pre- and compulsory school teachers) use of the outdoor environment in children's learning about living beings

Early childhood teachers' (pre- and compulsory school teachers) use of the outdoor environment in children's learning about living beings

Submitted as a book chapter in SAGE *International handbook of outdoor education in early years*.

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Abstract

The aim of this chapter is to discuss how the outdoor environment can be used to support children's learning about living beings. For that purpose, the chapter discusses a study in which preschool and compulsory school teachers in Iceland used the outdoor environment to support children's learning about living beings. Dewey's (1916/1966) theory of experience and education, place-based theories (Gruenewald, 2003), and sociocultural theories drawn from the work of Vygotsky (1978) form the theoretical background of the study. The study was part of an action research project called 'On the same path' that aimed to create a continuum in children's education from preschool to primary school. Five of the teachers who took part in that study chose to use the outdoor environment for this purpose. Data were gathered through interviews with the teachers and observations throughout the study period. The findings illustrate how the teachers used the outdoor environment to further children's experiences of living beings and how these experiences offered endless opportunities to discuss the ideas and concepts involved. The findings also illustrate how the outdoors was beneficial for children's freedom to move around, communicate, and play. Further, the teachers focused on the opportunities the outdoor environment had to offer and did not see using the outdoors as being dangerous for children in any way. Finally, the findings revealed that using creative activities outdoors was useful for teaching and learning science. Important implications of this study for school curricula are that the outdoor environment offered multiple opportunities to experience and discuss living beings. The study indicates

that the teachers saw using the outdoors as a way to simultaneously support children's learning, their overall development and well-being. Also the study indicates that the teachers of the two school levels can learn from each other about supporting children's learning. At last how teachers can support science learning through children's play is worth a closer look.

Introduction

The aim of this chapter is to shed light on how preschool and compulsory school teachers in Iceland used the outdoor environment to help children learn about living beings and how their ideas and practices changed during an action research project in which they participated.

Outdoor learning is a concept used for many different organised educational activities taking place in different environments outside the school building (see, for example, Rickinson et al., 2004). Here it is used in the context of regular preschool- and compulsory school-based activities in the local outdoor environment. Jordet (2010) prefers to talk about 'outdoor school' as a way of regularly working with curriculum content outside the classroom.

According to him, physical activities, social interactions, and learning go hand in hand in the outdoor school. In his definition, teaching outside is closely linked to classroom teaching and provides integrated education.

In the Icelandic national curriculum guidelines for preschools and compulsory schools, the outdoor environment is perceived as beneficial in children's lives; it is viewed as a rich environment for play and learning, an arena for exercise and healthy lifestyles, and a place that fosters positive attitudes towards the environment (Norðdahl & Jóhannesson, 2015). The curriculum guidelines also emphasise fostering children's positive attitudes and interest in science (Ministry of Education, Science and Culture, 2011; 2014).

Even if the curricula for preschool and compulsory schools differ, they have many similarities. Children should be encouraged to explore nature, to ask questions, and to search for diverse solutions. Enjoyment of and respect for nature are emphasised in the curricula, as

is reflection on how human behaviour can affect nature. Both curricula also mention gaining experience with and learning about living beings (Ministry of Education, Science and Culture, 2011, 2014).

The outdoors and children's learning

The importance of interaction and experience with the physical environment is often emphasised as an important part of children's education. This has been the core of outdoor education for a long time, drawing on Dewey's theory of experience and education (Quay & Seaman, 2013). Dewey (1916/1966) saw learning from experience as a practical process involving children's activities as well as their reflections on the consequences of their activities. The importance of where the learning takes place and children's experiences and explorations of these places is emphasised in place-based theories of learning (Gruenewald, 2003). Place-based learning involves finding ways to connect children with their community and local environment outside the classroom and helping them practice their democratic rights through participation in their community (Gruenewald & Smith, 2008).

Children's outdoor environments and the experiences that they offer affect children, both in their learning about it and their views and actions toward it. In the literature (see for example, Davis, 2010; Louv, 2010), young children's positive experiences with outdoor environments, especially those with nature and their emotional attachment to nature, are considered crucial to motivating children to respect the natural environment and take action to preserve it.

In their various experiences with the outdoors, children are likely to focus their attention on an array of elements, living things, and natural events. In young children's science education, adults' assistance and support in noticing the science manifested in everyday situations are vital (Fleer & Pramling, 2014). In this sense, teachers play a principal role in focusing children's attention on what can be learned by different aspects of the outdoors.

Scott, Asoko, and Leach (2007) point out that scientific knowledge is created in the community of natural scientists, and children cannot discover such knowledge by experiencing the physical environment alone; they must also have contact with people who have mastered these concepts. Research has revealed that merely experiencing the physical environment is not enough for learning concepts in science. If the teachers do not use the opportunities the environment offers to teach children about nature, children might not learn much about it as Ejbye-Ernst (2012) found in his study in Danish preschools. This brings us to the roles of language, communication, and culture in children's learning.

The sociocultural theory of learning draws on Vygotsky's (1978) work, which emphasises that children learn through interactions with other children and adults and through the culture we live in. Guðjónsson (2008) argues that learning science, like learning other subjects, involves specialised language that is different from everyday language, and thus, learning a new subject can be seen as learning a new language. Furthermore, Askeland and Maagerø (2010) claim that an increased emphasis on introducing specific subject areas to children in preschools can provide opportunities to direct their attention towards words and concepts related to these areas. New words and concepts linked to science thus have the potential to become part of children's everyday life in preschool and therefore become valuable for children's language development and their learning about science (Siraj-Blatchford & MacLeod-Brudenell, 1999). Thus, it is not only the opportunities the environment offers that stimulate children's learning but also the quality of interaction with others and if and how teachers use scientific concepts and support children's explorations and reflections (Gustavsson & Pramling, 2014; Klaar & Öhman, 2014).

A number of studies (see, for example, Allen, 2010) have confirmed that children's ideas about the world are not always in line with scientific explanations. Thus, it is important for teachers to listen to children to discover how they think about the ideas and concepts in

question in order to respond to their ideas in ways that support learning (Allen, 2010; Ausubel & Robinson, 1971). The importance of educators listen to children, support their enquiries, and discuss their hypotheses regarding the topics involved has been increasingly emphasised in young children's learning (see, for example, Harlen, 2006). Fler and Pramling (2014) point out that in young children's science learning, the teacher's role is to help children link their thinking from one time to another and to use every day experiences to support scientific understanding and scientific concepts to understand everyday experiences. Research findings confirm that discussions in which diverse ideas are explored—children's ideas as well as scientific explanations—help children learn concepts (see, for example, Asoko & Scott, 2006; Arason & Norðdahl, 2006; Braund, 2009; Gustavsson & Pramling, 2014; Norðdahl, 2002; Óskarsdóttir, 2006).

Children's questions and educators responses to them are also important to the learning process. The findings from a Swedish study (Thulin, 2011) examining preschool teachers' and children's discussions about science, the conversations were characterised by a traditional pattern where the teachers asked questions and the children responded. When the children asked questions, the teachers responded by asking other questions. As a result, the teachers sometimes did not answer the questions the children had raised, and so their attention wandered to other things.

Pramling Samuelsson and Johansson (2006) have proposed play and learning as two dimensions of children's worlds, both involving their experiencing and making meaning of the world around them. They also point out that in preschool practice play and learning have been kept apart. In the Icelandic national curriculum guide for preschool and compulsory school (Ministry of Education, Science and Culture, 2011; 2014), the role of play in young children's learning is emphasised. Despite this emphasis, the connection between play and learning with specific learning goals in mind is still unclear in Icelandic preschool practice

(Einarsdóttir, 2010a; Hreinsdóttir & Einarsdóttir, 2011). Ideas about the role of children's play have swung between looking at play as children's free activity in which adults should not interfere or exert control and looking at children's play as a way of learning that adults should support and participate in (Ärlemalm-Hagsér, 2008). In Iceland, research findings indicate that preschool teachers' emphasis informal teaching through children's play and creative work (Einarsdóttir, 2001, 2010a; Einarsdóttir & Karlsdóttir, 2005). Einarsdóttir (2006, 2010a) found that preschool teachers in Iceland see their role mainly as caring for and supporting children's social and emotional development and they see their roles as caretakers and teachers as inseparable. Einarsdóttir's (2010a) research indicates that preschool teachers are at crossroads regarding how they see their role in children's lives.

As play is regarded to be of significant importance in young children's learning, its role in science education is worth considering. Many preschool teachers believe that children learn about nature and science through their play and experience (Ejbye-Ernst, 2012). Research findings from preschools where children played freely with materials have demonstrated that teachers' intervention in their play was crucial for children's learning about physical and biological concepts (Fleer, 2009; Siraj-Blatchford & Siraj-Blatchford, 2002). This highlights the importance of teachers in children's learning and the significance of their support in children's learning through play (Fleer & Pramling, 2014).

In the Icelandic national curriculum guidelines for both preschool and compulsory school levels, one of the fundamental pillars is creativity. Thematic or integrated educational approaches are recommended and play is seen as important in children's learning (Ministry of Education, Science and Culture, 2011; 2014). Integrating visual arts and science has appeared to further children's interest in and understanding of the issues they were working on (see, for example, Hickey, Robson, & Flanagan, 2013).

Present Study

In the Nordic countries, there is a tradition of connecting outdoor activities and particularly the natural environment (Halldén, 2009) with the notion of a good childhood (Einarsdóttir, 2006; Waller et al., 2010). One characteristic of the traditional preschool curriculum in Iceland is outdoor activity. Several indicators have demonstrated that interest in children's outdoor play and learning in preschools and compulsory schools in Iceland is increasing (Óladóttir, 2012). This mirrors trends in other Nordic countries (Bentsen, Mygind, & Randrup, 2009; Bentsen, Jensen, Mygind, & Randrup, 2010; Borg, Kristiansen, & Backe-Hansen, 2008; Moen, Blekesaune & Bakke, 2008; Rantatalo, 2008). In spite of this increasing interest teachers' use of the outdoor environment in children's learning about living beings, is an understudied area (Bentsen, Mygind, & Randrup, 2009; Rickinson et al., 2004). The study will explore how preschool and compulsory school teachers, who participated in an action research project, use the outdoor environment to teach young children about living beings. Furthermore, the research traces if and how the teachers' ideas and practices change in the project. Thus, this study will contribute to knowledge in this area and increase understanding about teaching young children science, another area in which further research is needed (Cabe & Sackes, 2012; Flee & Pramling, 2014).

Participants and settings

The study was part of an action research project called *On the same path*. The general aim of the research was to create a continuum in children's learning between school levels by advanced collaboration between teachers of both school levels. An additional goal of the study was to strengthen the relationship between preschools and primary schools. Three pairs of preschools and compulsory schools participated in the research, and one of these pairs chose to focus on outdoor education, and using a joint outdoor area near the schools (Einarsdóttir, 2010b). Each pair of schools received support from specialists at the University

of Iceland. The authors of this chapter collaborated with the teachers and served as specialists, supporting the teachers regarding children's learning in science and outdoor learning. The first author also collected data throughout the project.

Three teachers from the preschool (two preschool teachers and one compulsory school teacher), Vala, Lilja, and Svava, along with ten 5-year-old preschool children, participated in the study. Two teachers from the compulsory school (one compulsory school teacher and one teacher educated as both a preschool and compulsory school teacher), Helga and Nanna, along with twenty 6-year-old children, also participated in the study.

The teachers decided to use more purposefully a little woodland area that the schools share when teaching the children about living beings. The teachers met regularly to discuss and plan different activities to do with the children. They sometimes also followed up the work they did outside, inside the school.

Ethical issues

The research was reported to the Icelandic Data Protection Authority, and the teachers that participated gave their informed consent in writing. The compulsory school principal and the preschool director gave their consents, and the parents of the children that participated were informed about the research and were asked to let the researchers know if they did not want their children to participate in the study or if they did not want pictures of their children used in the presentation of the findings. No one responded to this message.

The children were informed about the study and asked if they had anything against participating in the study or having their pictures taken during the project. None of the children said they had anything against the research or showed any signs during the project that they did not wish to participate. On the contrary, they found it exciting to participate, and they often asked when their pictures would appear in the newspaper. Both children and

teachers were promised that their real names would not be used in the presentation of the research findings.

Data gathering and analysis

Multiple methods were used to gather data. The teachers were interviewed individually at the beginning and end of the project. In the first interview, the focus was on how the teachers had used the outdoor environment in children's learning before the project started. In the end interview, the teachers' experiences of using the outdoor environment during the project were explored. Regular meetings were also held with the teachers to discuss the project and its progress. These meetings were either recorded or notes were taken.

Twenty observations were conducted, most lasting for about one hour. The first author occasionally participated in teaching and interacted with the children. For example, she responded to the children when they asked her about certain things and she sometimes showed the children something. The observations can, therefore, be regarded as participant observations (Lichtman, 2013). The teachers' and children's discussions were recorded when possible, and notes were taken. The teachers also collected data themselves—they wrote diaries, took pictures, and wrote notes about the pictures. The data from the teachers were used to fill in the picture drawn from other data.

In analysing the data, a six-step thematic analysis described by Braun and Clarke (2006) was used. First, all the interviews and the observation notes were transcribed. Next, the transcripts were read and reread and coded by hand according to the aim of the research. The third step involved finding possible themes from the codes. The fourth step included a re-examination of the themes in relation to the coded text. In the fifth step, the themes were clearly defined and given proper names. Finally, a report draft was written about the findings.

Teachers' use of the outdoors in teaching children about living beings

The teachers' use of the outdoor environment in children's learning about living beings and how their ideas and practices changed during the project were categorized into four themes:

The teachers used the outdoor environment as a *source of experience*, as a *ground for discussion*, as a *place for children's play and freedom*, and as *content in children's creative work*.

The outdoors as a source of experience

Being outside even in the middle of the winter offered various opportunities to experience and interact with organisms. To ensure that the children gained this experience, the teachers pointed out things in the outdoors that they wanted the children to notice, as well as living organisms they could hear and touch. This procedure concurs with the suggestions of Fleer and Pramling (2014) about the role of the teacher in focusing children's attention on the scientific issues found in their environment. The following description from an observation of the compulsory school group is an example of when a teacher used the opportunity in the outdoors to extend children's experience of organisms:

Helga has stopped, and I can see that they are observing something interesting. It is tracks or footprints of animals, and Helga is photographing them. The children discuss what kind of animal could have left these tracks. I join the group, and we also see other kinds of animals' traces like droppings and pee. The children investigate the footprints with great interest. I point out some footprints and ask them who could have left them there. They say first, "A cat with long nails", but after investigating them further, we see that they are a bird's footprints. Then the children themselves start to make some tracks and observe them carefully and wonder if the birds could have five toes. "Maybe an eagle", one of the children said.

Here the teacher used the opportunities for experience this place offered for children's learning, which is in harmony with Dewey's (1916/1966) theory of experience and place-based theories of learning (Gruenewald, 2003).

The children were interested in the activities they were working on in the wood. However, often the activities were not followed up by the teachers with other activities and discussion and thus they did not use the learning opportunities to engage and maintain the children's interest and answer their questions, which is in harmony with Thulin's (2011) research findings. Moreover during the action research period the teachers discussed and agreed about the importance of following up such activities and aimed to improve this method in their work with children in the future.

In the interviews, when the teachers were asked why they wanted to use the outdoors in their teaching. They all responded that they found it important that children had opportunities to learn to know the wood—experience it and become interested in it. These teachers believed that the experience would help the children learn to appreciate and preserve their environment. In the last interview, Helga, a primary school teacher, said that one of the things she liked most about the project was how conscious the children had become of the environment. Children's consciousness about the environment is also emphasised in the curriculum of both school levels (Ministry of Education, Science and Culture, 2011; 2014) as well as in the literature on place-based learning (Gruenewald & Smith, 2008) and environmental education and outdoor literature (see for example Davis, 2010; Louv, 2010). In spite of this, the observations did not indicate the teachers' supporting this consciousness of the environment, apart from providing the children opportunities to experience the outdoors.

The outdoors as grounds for discussion

Even though using the senses and experience are the core of outdoor education (Quay & Seaman, 2013), the participating teachers did not assume that being outside in a natural

environment alone would further children's learning about nature as has been found in other research (Ejbye-Ernst, 2010; Fler, 2009). On the contrary, they emphasised discussing with the children their outside experience. Discussions among teachers and children in relation to the activities outside were the core of the project. It was interesting to see how the teachers came to the same phenomena and concepts regarding the living beings time and time again, building on children's experience. Sometimes it seemed as if the experience was not always crucial for the discussion or as Svava, a teacher in the preschool, noted in relation to a task where the children made bird-feeding houses: 'It is actually the discussion a task offers that is most important, so it doesn't matter if no birds appear.' In this instance, no birds came to the bird-feeding houses, but the task was still successful in directing the children's attention to birds in the area and to previous experiences with birds. Thus, the task provided multiple opportunities for discussion. This finding is in line with research that illustrates the teacher's support as crucial in the learning process (Fler, 2009; Siraj-Blatchford & Siraj-Blatchford, 2002).

The teachers' use of the outdoor environment was in harmony with sociocultural theories of learning (Vygotsky, 1978), and Dewey's (1916/1966) theory, of experience and education in which experience does not only refer to sensing different stimuli but also involves reflection on what happened. The discussion centred mainly on two things: First, children's ideas in relation to the issue involved and, secondly, the scientific explanations of the same issues.

The outdoor environment as grounds for discussing children's ideas

Discussing children's ideas and experiences was emphasised by teachers from both school levels. At the beginning of the project, for example, Lilja, one of the preschool teachers, asked the children what they thought was alive in the wood and how they could know if something was alive or not. One child replied, 'Christmas trees are alive' because 'they grow', and

another child said that we can know things are alive because they ‘have leaves’. The focus on discussing children’s ideas is in line with the emphasis in science education about the importance of finding out how children think about different issues in order to help them to understand scientific explanations of the phenomena involved (Allen, 2010; Asoko & Scott, 2006; Ausubel & Robinson, 1971). This focus was particularly evident in the preschool group.

To follow up on the children’s ideas with suitable challenging activities, various tasks were undertaken, such as investigating the growing of plants on a piece of ground in the spring, or seeing what happens to seeds in the soil. The children’s ideas of what would happen and how to perform such experiments were also explored. In the preschool group Svava, a preschool teacher, discussed with the children after they had planted seed in pots:

Svava: What have you been doing?

Child: Putting these (the seeds) into cans.

Svava: What do you think will happen when we put them in there?

Child: I think some flowers will come.

Svava: Do we have to do something more?

Child: Put in some water.

Svava: We need to add water so the plants will appear?

Child: Yes.

Svava: Great! Is it enough to add water just once?

Child: No it has to be done many times—a lot of water.

Svava: But if we put grass in the cans what will happen to it?

Child: Grass will come.

Svava: How exciting; we need to watch this carefully.

Svava: Anton has a whole spruce cone—what do you think will happen to it (if it is put into the mud)?

Child: Another cone will come.

Svava: Another cone will appear—you think so? We have to check it out.

Here the teacher uses open-ended questions to stimulate children's discussion about the activity and to encourage them to continue investigating and search for answers as is commonly recommended in young children's science learning (see, for example, Harlen, 2006).

Another example of enquiry in the outdoors, used to explore children's ideas of what would happen in an investigation, is when the preschool group investigated whether different things like a plastic tape, a candy paper, an apple, a piece of bread, and a can, nailed to a piece of wood, would rot if left outside on the ground for some time. One of the preschool teachers, asked the children what they thought would happen to these things. Later, when they returned to see what had happened, she reminded them about what they had believed would happen. Then they investigated whether anything had changed from the last time and discovered that the food items, like the apple and the piece of bread, were not there anymore. That way, the teachers helped the children link their thinking from the initial experiment to what they discovered. They used every day experiences to support scientific understanding and vice versa. They came to the concepts and phenomena again and again because helping children to change their thinking about issues does not happen at once (Fleer & Pramling, 2014).

The outdoor environment as grounds for discussing scientific explanations

Discussing scientific explanations of the phenomena and supporting children's understanding was also an emphasis of the project. The teachers explained scientific phenomena in four ways: (a) by focusing children's attention to scientific explanations that some of the children came up with, (b) by using the experiments to discuss scientific concepts, (c) by leading the

children to the right answer or directly correcting them, and (d) by presenting scientific explanations to the children.

In discussions with the children about their understanding of different phenomena and concepts, the teachers used the opportunity when some of the children came up with the ‘right answer’ to direct other children’s attention towards it. This was often done by repeating the answer, confirming that it was right, as the following example shows:

Child: There are no leaves on the trees.

Helga: There are no leaves (with emphasis).

Child: But these ones have, because this is a spruce.

Helga: Yes, this one is a spruce. Right, the leaves (needles) are on the spruce trees...you can say that.

This approach was common both in the pre- and primary school groups and for the teachers in the preschool. Presenting scientific knowledge to the children in this way was the most common way for the teachers in the study.

The following example from the preschool group shows how the outcome of an experiment was used to determine whether the children’s ideas were in line with the findings:

Vala, a preschool teacher: Do you remember when we picked the branches outside and you said they were dead?

Svava: Do you remember how we kept the branches?

Child: In a pot with water in it—so it could grow.

Svava: Wait now, what’s happening?

Child: There are already leaves.

Vala: Are the leaves already here? Come and see—you can touch them.

Child: Something green has come.

Child: Something sticky.

Svava: What's going on—what has happened?

Child: The leaves are here.

Svava: Are they alive?

Child: Not yet, first some more have to come.

Vala: Don't you find it strange that the leaves are growing in here but not outside?

Svava: If we had not had water in the pot, do you think this would have happened?

Child: No.

Svava: Why not?

Child: Because otherwise it will not grow.

Child: No leaves would come.

This example illustrates how the teachers used the experience that the children gained to refer to and reflect on the children's former experiences and ideas and how the teachers supported the children in understanding what was happening (Fleer & Pramling, 2014).

The teachers also brought scientific knowledge into the discussion by leading the children to the right answer or directly correcting their ideas. An example of this approach is when one of the primary school teachers asked the children what organisms there are in the wood now, during wintertime. One of the children answered that the flies and butterflies lived there. The teacher then gave some hints that flies and butterflies were there during the summer and the child accepted this and added that the flies and butterflies are asleep in their pupa to 'rest' [in the winter] ... 'for becoming a butterfly'.

Correcting children directly rarely occurred. An exception was when two primary school boys pointed out to their teacher Helga that they had thrown seeds into the pond, and added 'and we also threw in some mud', and said they were going to see if something

happened. Helga told them right away that nothing would happen because there was no oxygen there.

The teachers also brought scientific knowledge into the discussion themselves by attaching words to things. Teachers of both school levels named organisms when they talked about them. For instance: ‘This is called a pine needle’ or naming a species of organisms such as a ‘starling’ and ‘birch tree’. In this way, the children learned new words and concepts (Askeland & Maagerö, 2010; Guðjónsson, 2008; Siraj-Blatchford & MacLeod-Brudenell, 1999).

One of the primary school teachers was active in providing information and explaining more complicated processes to the children, like why the leaves on the trees change colours in autumn. The preschool teachers, however, did this very rarely. The following discussion describes how they and the specialist from the university saw this:

Vala: I feel a bit uncomfortable about how much we should tell them. Should we teach them something about this? Or should we expect it to come from them?

Specialist: It is naturally best (that the ideas come from the children).

Vala: I know. I try to wait until it comes from them, though as before, I felt almost as if I should begin to tell them something.

Specialist: You can also do that when you have found out how children think about it, and then add something to it, read a book, etc.

The preschool teachers seemed to see their main role as helping children to look for answers instead of giving them the answers. They did not want to be in the role of an instructor, rather listening to the children and supporting them in their enquiries. They may also have seen it as interrupting children’s enquiry by giving them the answers as Harlen (2006) has discussed. In this respect it is important to distinguish between what children can learn from their own observations and experience and what they need to learn from other

sources such as teachers or books (Scott et al., 2007). The preschool teachers did not seem to find it important to share knowledge with the children. They preferred to use informal teaching through children's play and creative work as other Icelandic research has revealed (Einarsdóttir, 2001; 2010a; Einarsdóttir & Karlsdóttir, 2005).

The outdoor environment as a place for play and freedom

The data showed that the teachers used the outdoor environment to meet children's needs and interests. One of the teachers remarked that outside children who have difficulty concentrating for long periods of time have opportunities to do things without disturbing other children. Some of the teachers also found that using the outdoors was important for children's physical development and social interaction. These findings indicate that the teachers see using the outdoors as a way to work simultaneously on children's learning and overall development in a way that Jordet (2010) argues the 'outdoor school' offers.

The children often used the opportunities provided to climb the trees, and the teachers never showed any signs of finding this dangerous, even if children often climbed two or three times their own height. The teachers had some safety rules to follow outside, and they seemed to work well and did not restrict children's freedom. This is in accordance with Nordic teachers' view that they value the educational opportunities the outdoors offer more than the possible dangers for the children. Such practice contradicts the discourse of fear that seems to restrict practitioners from other countries in using the outdoors (see for example Norðdahl & Jóhannesson, 2014, 2015).

The following description from the observation field notes shows that the teachers value children's opportunities to play:

On one of the trips, one of the compulsory school teachers Nanna stated that the children loved being in the woods. We discussed how quickly they begin to play out there, and Nanna wondered if they discussed on the way what they wanted to do. She

mentioned that the children play a lot in the school and that the teachers were very positive towards children's play.

The compulsory school teachers showed consideration to children's play, their interest, and participation in the project, but it is difficult to state whether that view was unique to this project. However, it was apparent that the children's participation and the teachers' willingness to follow children's interests were more dominant in the end than in the beginning of the project. This can be seen as an indication of compulsory school teachers' increase in supporting children's own enquiries in their teaching as is recommended in the science education literature (see for example Harlen, 2006).

The preschool teachers discussed in one of the meetings that before the project started they had emphasised children's free play in the wood or, as Svava said, '...You went out and nothing was planned, you just went out and the children played'. Through this project, the preschool teachers wanted to improve their skills in supporting children's learning about nature, or, as Vala said:

I wanted to learn how to use the wood...in another way than just setting a fire, where the children would get a greater sense of nature...I feel...we've got a bit of this now. Sometimes, the preschool teachers directed children's play in the outdoors, for example searching for objects with names beginning with certain letters, or telling the children a story like Vala did:

The story is about a mouse family living in a hole in the wood. This is the mouse's mom and dad, Vala says, and you could be the mice pups. The mice pups are always playing but they don't have any toys. The children are encouraged to go and play for a while and then bring toys back when Vala calls. They can hardly wait to be called in, and they quickly found some toys. They bring all sorts of things, such as cones, branches, stones, bricks, and balls for the mice. Vala gets them to talk about the

objects and how they look. The children compare the objects in size, weight, and texture, and to notice the variety of the branches they found.

The preschool teachers had contradicting views in regard to how they viewed play in goal-oriented learning which is inconsistent with how play and learning is often kept apart in preschool practice (Pramling Samuelsson & Johansson, 2006). When discussing how to use children's play in teaching, one of the specialists from the university proposed the idea of getting the children to play like they are birds making their nests, Vala said, 'This is something we are not very keen on', adding that '[children's] spontaneous play is not something we can create'. But after the specialist pointed out that it would perhaps be possible to direct children's play in some way, referring to the nest-making, the teachers all agreed that this could be a good way to support children's learning through their play. This shows that the teachers did not think about children's play and its role in children's learning in a consistent way. On the one hand is the view that using children's play can be a good way to teach something specific, and on the other hand is the desire to respect children's play and not disturb it with predetermined learning goals. These contradicting views on the role of play in children's learning have been found in previous research (Ärlemalm-Hagsér, 2008; Einarsdóttir, 2010a; Hreinsdóttir & Einarsdóttir, 2011). The preschool teachers' decision to participate in this project, where the aim was to teach children about certain issues, can be seen as a sign of their reconsideration about their role in children's learning as has been observed in other studies (Einarsdóttir, 2010a).

The outdoor environment as a subject for creative work

During the project, the teachers of both school levels used visual arts in the woods. For example, they encouraged the children to draw pictures of the trees. In order to do so, the children had to observe the trees carefully. The teachers also used creative work to reflect on what the children had experienced outside. One example is when Margret, a preschool

teacher, invited the children to draw and create clay figures of organisms in the wood. Some of the children drew trees with branches ‘for climbing’, some drew food trays, some made worms out of clay, and one child drew a very dense thicket of trees. Drawings of other things that did not originate from the wood such as an apple tree also appeared. This method is in line with the emphasis on creativity and integration in the national curriculum (Ministry of Education, Science and Culture, 2011; 2014). The use of the visual arts has been found to be a good way to focus children’s attention on the issues involved, as was the case in this project. Visual art was also a good way for the children to learn about different ideas, and it offered multiple opportunities for the children to reflect on their experience and develop their understanding as has been found in other studies (Hickey, Robson, & Flanagan, 2013).

Conclusion and implications

An important implication of this study for school curricula is that the outdoor environment offered multiple opportunities for the children to experience living beings. The experience of living beings in the wood as well as the teacher-led enquiries was fundamental as the teachers were good at focusing children’s attention on things of interest. This exploration makes it possible for the teacher to combine the experience of the environment with the learning of scientific knowledge.

Another important implication and interesting finding was the emphasis the teachers put on discussing with the children the experience provided in the outdoor environment. They did not believe that children would learn about the living beings only by experience, instead they supported the children in their learning by discussing the same things over and over again. They emphasised discussing children’s own ideas as well as using scientific explanations. With this method, children had opportunities to explore different ideas and develop their scientific understanding, though the teachers expressed that they would like to follow up with activities better in the future.

The third important implication of the study is how differently the preschool teachers and compulsory school teachers approached the teaching. The preschool teachers placed emphasis on supporting the children's own enquiries and search for answers instead of explaining scientific concepts or phenomena, which was much more common in the compulsory school group. Both approaches have been found valuable for children's learning. In each, the task becomes striking a balance between, on the one hand, encouraging children to make hypotheses and explore their environments, and on the other, providing them with scientific explanations. As such, teachers at the two school levels have much to learn from each other, and their future collaboration would be highly beneficial.

The fourth implication of the study is that it indicates that the teachers see using the outdoors as a way to work simultaneously on children's learning and their overall development through the opportunities the outdoors offers for children's physical and social development as well as using creative means in their learning such as the visual arts. The findings also indicate that these teachers were not afraid to take children outside and found securing the children's safety outdoors as a natural part of the outdoor teaching.

Interestingly, concerning teachers' divergent views of using play in children's learning, though teachers regarded free play as children's primary mode of learning, they also argued that children's free play belonged to the children and that educators should not try to determine it. It would thus be worthwhile to investigate how teachers can support science learning through children's play and integrate play and learning instead of isolating them, as Pramling Samuelsson and Johansson (2006) have advocated.

Participating teachers also conceived using the outdoors as a means to affect children's views and action toward outdoor environments. Their chief purpose of using the outdoors in children's learning was to offer them opportunities to get to know their local environment, experience it, and become interested in it. By this they considered that the outdoor

environment could provide opportunities to foster children's positive attitudes toward the outdoors and argued that such would nurture their desire to use the resource with responsibility and care. It remains unclear, however, whether this process occurs spontaneously, as the teachers in this study expected, or whether additional actions are necessary to increase its possibility.

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