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To cite this article: Leena Kiviranta, Eila Lindfors, Marja-Leena Rönkkö & Emilia Luukka (05 Dec 2023): Outdoor learning in early childhood education: exploring benefits and challenges, Educational Research, DOI: [10.1080/00131881.2023.2285762](https://doi.org/10.1080/00131881.2023.2285762)

To link to this article: <https://doi.org/10.1080/00131881.2023.2285762>



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Published online: 05 Dec 2023.



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# Outdoor learning in early childhood education: exploring benefits and challenges

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## ABSTRACT

**Background:** Studies indicate that access to nature may increase general human health and wellbeing. As a learning environment, the outdoors can also positively influence children's personal and social growth, healthy development, wellbeing and learning abilities. To maximise the potential offered by outdoor learning, it is necessary to gain deeper understanding of its implementation, particularly in early childhood education and care (ECEC) settings.

**Purpose:** This review study sought to explore a small subset of relevant literature in detail, in order to identify and describe the noted benefits and challenges of implementing outdoor learning in early childhood.

**Method:** A narrative synthesis was undertaken. In total, 20 studies from 10 different countries on learning outdoors during ECEC were selected for in-depth analysis and synthesis. The benefits and challenges of outdoor learning implementation in ECEC were identified and categorised using thematic analysis.

**Findings:** The analysis yielded a detailed description of the opportunities, preconditions and resources for outdoor learning. Six data-driven categories emerged (i) children's holistic development; (ii) health and wellbeing; (iii) multimodal, hands-on learning opportunities; (iv) experiences in and of nature; (v) teachers as mediators; and (vi) the organisation of outdoor learning. Overall, these categories suggested that three main elements need to be considered when planning and implementing outdoor learning: as well as providing experiences in and of nature for children, outdoor learning may benefit the holistic wellbeing and well-rounded development of children and can offer multimodal, hands-on learning opportunities. According to the analysis, one of the main challenges related to teachers' understanding and knowledge around organising and implementing outdoor learning opportunities for young children.

**Conclusion:** In addition to highlighting the compelling potential benefits of outdoor learning in ECEC, the study findings draw attention to the need for teachers to be supported in developing the required competences to implement outdoor learning. In particular, introducing multimodal outdoor learning into educational practice necessitates pre- and in-service teacher education and professional development.

## ARTICLE HISTORY

Received 27 January 2023

Accepted 16 November 2023

## KEYWORDS

Early childhood education and care (ECEC); outdoor learning; wellbeing; hands-on learning; teacher development; narrative review

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## Introduction

An increasing number of studies suggest that access to nature may improve general human health and wellbeing (Simkin, Ojala, and Tyrväinen 2020; Tyrväinen et al. 2014; von Hertzen, Hanski, and Haahtela 2011). At the same time, some modern lifestyle characteristics (e.g. growth in sedentary time spent indoors) have been associated with various health problems (Lee et al. 2012). Evidence indicates that being outdoors and playing in nature are essential for children's healthy development (Amus 2013; Chawla 2015) and formal learning (Kuo, Barnes, and Jordan 2019) and that children's wellbeing *and* learning can benefit from the use of outdoor spaces as learning environments (Amus 2013; Chawla 2015; Kuo, Barnes, and Jordan 2019). Research has shown how the notion of nature as a learning environment has encouraged some educators to teach outdoors, with studies typically focusing on teachers' (Hartmeyer, Stevenson, and Bentsen 2016; Henriksson 2018) or students' (Harvey et al. 2020) experiences of teaching and learning outdoors.

Internationally, differing contexts and conditions all influence the appetite for, and feasibility of, outdoor learning. Its practice is dependent on many contextual factors, including the weather, culture, safety and the availability of outdoor spaces nearby. For example, in Nordic countries, there is a strong cultural heritage and tradition linked to outdoor life and recreation, which transfers into the education system, too (Sandseter and Lysklett 2018). In Finland, for instance, citizens have public access rights to trek freely in the forest and countryside, to camp for short periods and to pick mushrooms and berries (Tuunanen, Tarasti, and Rautiainen 2015), thus reflecting how it becomes more possible to enjoy nature as a learning environment if it is easy to reach (Amus 2013; Henriksson 2018). Outdoor learning, therefore, constitutes a significant component of Finnish early childhood education and care (ECEC) content and practices, despite cold climate conditions. This emphasis on outdoor learning is further underscored by its inclusion in the Finnish National Core Curriculum for Early Childhood Education and Care (FNBE 2022).

Outdoor learning is predicated on the idea of venturing outside rather than learning in indoor classroom settings. Whilst particular descriptors and categorisations may vary, in this article, we have adopted a definition for outdoor learning based on the Nordic definition of outdoor life (Sandseter and Lysklett 2018) to characterise outdoor learning, wherein children can move, play, design and actively investigate, construct and express their ideas. An outdoor learning environment is perceived as either a purposefully constructed space or a natural, untouched setting that allows learners to engage in genuine and experiential learning encounters. This environment typically comprises outside spaces, such as forests, lakes, parks or playgrounds (Chawla 2015), but it can also encompass specialised outdoor learning centres (Fuller, Powell, and Fox 2017), field trips (Henriksson 2018) or rural locations (Kaasinen 2019). Such settings can provide children with opportunities to use all their senses (Chawla 2015).

In order to maximise the potential offered by outdoor learning, it is necessary to gain deeper understanding of implementation – both in terms of benefits and challenges – particularly in ECEC settings. The preliminary narrative review study reported in this article sought to contribute some steps towards this endeavour. It had the broad aim of

synthesising insights that could ultimately be used to support teachers' implementation of outdoor learning, thereby enhancing children's opportunities for outdoor learning in the future. Ahead of setting out the study in further detail, though, we seek to situate our review in the wider research context.

## Background

The effects of spending time in outdoor environments have been studied across a range of age groups. Nature and outdoor environments have been shown to have a calming effect on individuals and can be beneficial for restoration (Simkin, Ojala, and Tyrväinen 2020). There is evidence that these surroundings may reduce stress and promote vitality, creativity and positivity (Lee et al. 2012; Tyrväinen et al. 2014). Additionally, natural settings can prompt positive emotions (Tyrväinen et al. 2014) and decrease negative ones (Simkin, Ojala, and Tyrväinen 2020); even looking at pictures of nature, compared with pictures of urban settings, has been considered to have positive effects on participants' emotional states and physiological activity levels (Ulrich et al. 1991). Research suggests that simply spending short periods of time in nature, or watching natural landscapes, can lower one's pulse rate and blood pressure and reduce cortisol levels, while enhancing parasympathetic nervous activity (Lee et al. 2012). The biodiversity hypothesis encourages people to be in nature for health and wellbeing reasons: to touch, eat, breathe, experience and enjoy nature (Haahtela 2019). According to von Hertzen et al. (2011), contact with natural environments can enrich the human microbiome, protecting against allergic and inflammatory disorders and promoting immune balance. Preserving and strengthening a connection with nature, and pursuing outdoor activities instead of having a sedentary lifestyle, are therefore emphasised.

Both indoor *and* outdoor environments have benefits for children's learning. In terms of outdoor environments, being in nature is thought to enhance learners' concentration and attention (Kuo, Barnes, and Jordan 2019). Studies that focus on children's experiences of spending time outdoors for recreational and learning purposes have shown reductions in primary students' stress (Chawla et al. 2014) and mood improvement (Harvey et al. 2020). Outdoor environments may foster a sense of self-confidence and efficacy in adolescents (Fuller, Powell, and Fox 2017). An environment that provides children with freedom of choice and a variety of objects for discovery, creative use and play (Chawla et al. 2014; Kiewra and Veselack 2016) naturally supports children's activity and participation, and encourages them to be more physically active and fit, while enhancing learning. Outdoor learning has, too, been shown to develop social and communication skills, perseverance, persistence and self-regulation (Kuo, Barnes, and Jordan 2019).

Several studies, such as those by Chawla et al. (2014) and Harvey et al. (2020), indicate that vegetation and elements of nature in classrooms, in schools, on early childhood centre grounds and in areas near schools, can facilitate learning and improve student achievement. Playground implementation projects that introduce or increase natural elements are regarded as offering many benefits for children, such as reduced stress, anger, inattention and problem behaviour (Chawla et al. 2014). The presence of natural elements may help to promote social-emotional development among primary school

children, with studies suggesting that replacing built surfaces with natural landscapes around schools can lead to decreased rates of antisocial behaviour, anxiety and depression (Sajady et al. 2020).

Many primary school teachers are aware of the potential of using natural environments as integrating contexts for various school subjects (Henriksson 2018). The degree to which this takes place differs from subject to subject. Dymont (2005), for example, found that some teachers utilised natural environment school areas more often in physical education and science than in other subjects. Maynard and Waters (2007), however, reported that teachers' outdoor learning pedagogy was not significantly different from their indoor pedagogy, so opportunities for outdoor learning possibilities were overlooked. It was evident that weather conditions were the biggest barrier, as teachers used outdoor environments only in pleasant weather (Maynard and Waters 2007), although Amus (2013) reported that, irrespective of weather conditions, children could engage in outdoor activities throughout the entire year. Research provides interesting observations about attitudes and practicalities that facilitate outdoor learning. First, to enable children to have access to nature, it is considered that the teacher must possess a supportive attitude and a willingness towards outdoor activities (Henriksson 2018). Second, there is a need for the teacher and the children to wear suitable attire, including clothing and footwear, as might be necessary for the relevant weather conditions. By doing so, they can learn to take responsibility for dressing appropriately, according to the prevailing weather situation (Amus 2013).

It is evident that young children learn in a holistic manner, absorbing new knowledge and skills that connect to their everyday lives and the world they experience (Kiewra and Veselack 2016). Kiewra and Veselack (2016) emphasised that, in order to learn, young children must experience things for themselves, process information in a way that is suitable for them, struggle with problems, and use imaginative and creative ways of finding solutions. They learn through playing, moving, exploring, working on different assignments, expressing themselves and carrying out versatile activities (Yliverronen 2014). In previous studies, learning outdoors has enabled children to undertake exploratory and free-flow play (Olliff-Cooper et al. 2021) and create their own play culture (Chawla et al. 2014). Playing in the natural environment is not only good for children's physical, social and cognitive outcomes, but it also allows children to gain knowledge and skills (Ernst et al. 2021).

Outdoor environments as learning environments have the potential to empower children to let their imaginations and bodies roam free to transform their surroundings, to invent and create. Furthermore, large amounts of natural materials can provide great opportunities for children's creative play (Kiewra and Veselack 2016). Natural raw materials, such as pieces of wood, sticks, dirt, stones, leaves, ice, snow and sand, can inspire children's imaginations (Chawla et al. 2014; Kuo, Barnes, and Jordan 2019). Additionally, playing with natural materials and learning outdoors is thought to increase children's care, love and respect towards nature, sustainable behaviour and their connection with nature (Chawla et al. 2014; Ernst et al. 2021; Harvey et al. 2020; Henriksson 2018). In all, research makes clear that early childhood is a critically important period in children's development, including in terms of sustainability education, as the attitudes, values and foundational skills learned in early childhood extend throughout life (Ernst et al. 2021).

## Purpose

The aim of this review study was to conduct a small-scale, preliminary narrative synthesis of a specific set of relevant literature, so as to identify and describe noted benefits and challenges of implementing outdoor learning in ECEC. The main research question we wanted to address was as follows: *What are the common benefits and challenges of implementing outdoor learning in ECEC?* We took, as our starting point, the widely held position that natural environments can have multiple positive effects on children's health, wellbeing and learning abilities (Amus 2013; Chawla 2015; Roslund et al. 2020).

## Method

A detailed narrative synthesis, focused on a small subset of relevant peer-reviewed literature, was selected as the most appropriate methodological approach (Grant and Booth 2009; Snyder 2019) to address our study's aim. The main responsibility for data collection and analysis was assigned to the first author. We firstly conducted a search of relevant studies from peer-reviewed journals, using multiple databases via the electronic library database of the authors' university. This provided access to a wide range of publications and sources, including ProQuest's Education Database, EBSCO Education Source, ERIC and Web of Science. The search included keywords to classify the articles on the topic: *outdoor learning* or *outdoor education* or *outdoor spaces* and *early childhood education*. The primary criterion for inclusion was peer-reviewed articles in English specifically related to early childhood education and outdoor learning/education. Based on this, we identified 131 articles. We searched for articles published between 2009 and 2020, and excluded studies pertaining to medical and outdoor environment construction, and studies focused on out-of-classroom environments that did not involve natural settings (e.g. museums). Articles were considered based on their significance and scientific quality, particularly in terms of how far they presented a clear description of the data and results. Peer-reviewed conference proceedings were not incorporated into the final selection. The inclusion criteria were discussed collaboratively, and a critical evaluation of the articles was conducted to incorporate the most pertinent studies into the final dataset.

This process yielded a total of 20 peer-reviewed journal articles, published between 2009 and 2020, that represented the final dataset (see [Appendix A](#)). Most of the selected articles ([Table A1](#)) focused on children's views about outdoor learning ( $n = 8$ ). Teachers' perspectives were identified in four studies, and five included teachers' and children's experiences. One study included both teachers' and parents' points of view, and another featured not only children's viewpoints but also those of parents and teachers. Only one study focused strictly on parents' views on outdoor learning. Two studies included children and teachers from early childhood and primary education. Numbers of teacher participants ranged from 5 to 490, whilst the number of children taking part in the studies varied between 6 and 200. Qualitative, quantitative and mixed-methods research approaches were all evident within the 20 articles. Some studies considered outdoor learning from the perspective of different outdoor environments. The countries represented in the selected studies were from across three continents and comprised Australia

(five studies), USA (three studies), the United Kingdom (two studies), Norway (two studies), Sweden (two studies), Finland (two studies), Canada (one study), New Zealand (one study), Turkey (one study) and Estonia (one study).

The data were analysed using an approach based on abductive thematic content analysis (Elo et al. 2014; Grant and Booth 2009). In terms of analysis procedure, the first article was scrutinised by all researchers, with the aim of achieving a shared, consistent understanding of what could be regarded as a benefit and/or challenge of outdoor learning (according to each particular article). Then, for all selected articles, the benefits and challenges, as themes, were identified and organised into a table by the first author. The other authors actively participated in the categorisation process to ensure the consistency of the analysis. In cases of ambiguity, collaborative discussions were conducted to resolve any uncertainties. For instance, a notable outcome of these discussions was the relocation of the 'teacher's view of children's development' subcategory from the 'holistic development of children' category to the 'teachers as mediators' category.

## Findings

As a result of our close analysis of the 20 selected papers, the noted benefits and challenges of implementing outdoor learning in early childhood were categorised into six data-driven categories. These were as follows: (i) holistic development of children; (ii) health and wellbeing; (iii) multimodal hands-on learning opportunities; (iv) experiences in and of nature; (v) teachers as mediators; and (vi) the organisation of outdoor learning. The benefits and challenges of each category were further broken down into subcategories. Altogether we identified 17 subcategories associated with benefits and 10 subcategories associated with challenges of outdoor learning in ECEC. Following this analysis, we critically examined the findings we had obtained. During our discussion, we observed that the six initial categories addressing the benefits and challenges of outdoor learning could be further consolidated into three main categories: (1) Opportunities for a child; (2) Natural environment as a resource; and (3) Pedagogical preconditions. These main categories and subcategories are summarised in Table 1.

In the subsections below, we present the outcome of the analysis in detail according to each main category, elaborating each time on the categories and their respective subcategories. It is important to bear in mind that certain categories were identified as representing benefits *and* challenges, reflecting their dual nature in the context of outdoor learning.

### **Main category 1: opportunities for a child**

This main category highlights the benefits of implementing outdoor learning in ECEC. It includes two categories: *Holistic development of children* and *Multimodal hands-on learning opportunities*.

The *Holistic development of children* category consists of two subcategories of benefits: *Social and personal development* and *Diverse learning*. In our analysis, the idea of outdoor learning as beneficial to children's social and personal development was supported by the following studies: McClintic and Petty (2015), Merewether (2015), Robertson et al. (2020), and Rymanowicz et al. (2020). It was evident, too, that the natural environment stimulated children

**Table 1.** Categories emerging from the thematic analysis: benefits and challenges of implementing outdoor learning in ECEC.

Main categories of outdoor learning	Categories of outdoor learning	Subcategories related to benefits of outdoor learning	Subcategories related to challenges of outdoor learning
Opportunities for a child	Holistic development of children	Social and personal development Diverse learning	
	Multimodal hands-on learning opportunities	Enhancement of creativity Use of senses Hands-on learning	
Natural environment as a resource	Health and wellbeing	Enhancement of health and activity level Enhancement of joy and satisfaction	
	Experiences in and of nature	Learning about nature Materials in nature Taking care of the natural environment	Restrictions in the use of materials Lack of learner motivation
Pedagogical preconditions	Teachers as mediators	Teacher's role in outdoor learning Teacher's competence in outdoor learning	Teacher's role in outdoor learning Lack of knowledge and motivation to use outdoor environments Teacher's view of children's development
	Organisation of outdoor learning	Space and equipment Weather conditions Parents' role in enhancing outdoor learning Positive relation to community Use of digital devices	Space and equipment Weather conditions Parents' role in preventing outdoor learning Administrative work Safety and prevention

to work more as a team, sparking interaction during practical, hands-on activities that improved children's sense of responsibility, competence and social-emotional skills (Zamani 2016). Further, Hill (2018) found that the children learned outdoors to assume leadership roles and leadership for the wellbeing and safety of team members. In addition, children's self-confidence, independence, communication and decision-making skills were enhanced. These findings related to collaboration, social skills and conversation skills were supported, as well, by Boileau and Dabaja (2020), and Tuuling et al. (2019). The teachers in the study by Mårtensson et al. (2009) noticed that, whilst outdoors, children paid greater attention, while Rymanowicz et al. (2020) found that children asked more in-depth questions. Children themselves valued playing, pretending, moving and observing with others (Harris 2017; Merewether 2015).

In terms of children's diverse learning, some studies indicated that outdoor learning could significantly enhance children's preacademic (Puhakka et al. 2019), cognitive, linguistic and motor skills (Yildirim and Akamca 2017). Zamani (2016) layered this with learning about one's body, surroundings and one's understanding of risk. Outdoor activities influenced children's learning and development, especially when the activities were based on the children's ideas (Vartiainen et al. 2018). Furthermore, being outdoors inspired children's cognitive, constructive and sociodramatic play (Robertson, Morrissey, and Moore 2020; Sando and Sandseter 2020).

The *Multimodal hands-on learning opportunities* category comprises three subcategories of benefits: *Enhancement of creativity*, *Use of senses* and *Hands-on learning*. It was apparent that being outdoors stimulated children's creativity (Almers et al. 2020; Dowdell, Gray, and Malone 2011) and supported imaginative role-playing (Puhakka et al. 2019). Observation and inquiry-based activities, such as problem solving and creative thinking, were seen to influence children's imagination, joy, wonder and fantasy (Boileau and Dabaja 2020). Zamani (2016) linked inspiring children's curiosity and imagination to seasonal change and plants. Almers et al. (2020) found that children's creative outdoor activities encouraged ecological enquiry and reasoning.

The outdoor environment was seen as a place where children could use all their senses in the immediate exploration, testing and observation of nature (Dowdell, Gray, and Malone 2011; Harris 2017; Puhakka et al. 2019). Teachers valued engaging multiple senses, the affective dimension and practical and physical learning (Waite 2011). Being outdoors allowed children to dig their hands into the soil (Dowdell, Gray, and Malone 2011) and use their senses to study, observe and test things (Tuuling, Öun, and Ugaste 2019): for example, by smelling and tasting vegetables or berries (Puhakka et al. 2019).

The hands-on learning subcategory featured making and doing in practice and gaining authentic outdoor experiences (Dowdell, Gray, and Malone 2011; Tuuling, Öun, and Ugaste 2019; Zamani 2016). Children's hands-on activities outdoors included exploring, implementing or prototyping ideas (Vartiainen et al. 2018) and creating arts and crafts objects using available natural materials (Puhakka et al. 2019). Child-centred, inquiry-based activities were closely linked to hands-on learning because children interacted with what they learned directly (Tuuling, Öun, and Ugaste 2019).

### ***Main category 2: natural environment as a resource***

According to the analysis, the natural environment was regarded as an important resource for outdoor learning. It includes the categories *Health and wellbeing*, and *Experiences in and of nature*. The *Health and wellbeing* category consists of two subcategories of benefits: *Enhancement of health and activity level* and *Enhancement of joy and satisfaction*. In terms of the first subcategory, it was clear that outdoor learning was believed to activate learners and advance the health of children and teachers alike (Puhakka et al. 2019; Sando and Sandseter 2020; Tuuling, Öun, and Ugaste 2019). Being outdoors offered fresh air, and the space and freedom to express feelings (Waite 2011). Puhakka et al. (2019) found that teachers', teaching assistants', and children's moods improved, and their motivation and energy increased outdoors. Many studies have shown that outdoor learning increases children's activity levels (Almers et al. 2020; Dymont and O'Connell 2013; Nedovic and Morrissey 2013; Sando and Sandseter 2020). Not only were the children physically more active outdoors than indoors but they also appeared to be calmed by the natural environment. Learning outdoors improved children's physical skills (Nedovic and Morrissey 2013), particularly motor development and self-exploratory play. Adults noticed that being active outdoors improved children's appetite and quality of sleep (Puhakka et al. 2019).

The *Enhancement of joy and satisfaction* subcategory highlights the increased enjoyment (Harris 2017; Waite 2011), freedom and fun (Vartiainen et al. 2018) children may experience outdoors. Children were excited (Puhakka et al. 2019) and happy to be outside

(Tuuling, Õun, and Ugaste 2019); they easily discovered pleasant activities, such as climbing trees, sitting and resting on a branch (Almers et al. 2020) or on the ground, looking at the sky or listening to the different sounds (Puhakka et al. 2019).

The category *Experiences in and of nature* includes three subcategories of benefits: *Learning about nature*, *Materials in nature* and *Taking care of the natural environment*. In addition, it includes challenges related to *Restrictions in the use of materials* and a *Lack of learner motivation*. Nature could offer an abundance of natural materials, such as trees, bushes, sticks, stones, rocks, woodchips, plants, water, ice, soil, mud and sand, to be used in different learning activities (Dowdell, Gray, and Malone 2011; Puhakka et al. 2019; Sando and Sandseter 2020; Sandseter, Storli, and Sando 2020). These could be used for teaching activities, such as experimenting and writing, drawing, measuring and calculating (Tuuling, Õun, and Ugaste 2019). Nedovic and Morrissey (2013) reported that children themselves preferred natural materials over non-natural elements, such as commercial toys, in their daycare playgrounds.

The diverse natural environment was seen to offer a rich learning environment for teachers and children alike (Harris 2017; Tuuling, Õun, and Ugaste 2019), with multiple settings for discovery and exploration (McClintic and Petty 2015; Rymanowicz, Hetherington, and Larm 2020). Being outdoors captured children's interest, their willingness to learn increased (Puhakka et al. 2019; Rymanowicz, Hetherington, and Larm 2020), and their appreciation of nature and environmental awareness grew (Boileau and Dabaja 2020). Dowdell et al. (2011), Harris (2017), and Zamani (2016) posited that seasonal changes can contribute to increased knowledge and understanding of nature. In fact, Tuuling et al. (2019) underscore that to learn about nature, it is vital that children are surrounded by nature. Being outdoors and having natural playgrounds encouraged children to look after plants and vegetation. Digging their hands into the soil elicited positive feelings related to caring for their environment (Puhakka et al. 2019). In terms of challenges, however, it was notable that not all children were motivated to participate in such activities (Almers et al. 2020). Another challenge considered was the restrictions on materials and their uses, such as not being allowed to step on flowers or pick the plants (Nedovic and Morrissey 2013).

### ***Main category 3: pedagogical preconditions***

This main category reports on the pedagogical preconditions through two categories: *Teachers as mediators* and the *Organisation of outdoor learning*.

Noted benefits in the *Teachers as mediators* category relate to the *Teacher's role in outdoor learning* and *Teacher's competence in outdoor learning*. Further, the challenges were threefold, relating to the *Teacher's role*, possible *Lack of knowledge and motivation to use outdoor environments*, and the *Teacher's view of children's development*. The teacher's role was particularly important in supporting the children's interest and motivation in the outdoor environment (Vartiainen et al. 2018). Furthermore, the teacher's role was seen as a mediator or a more active facilitator, looking after the safety of children and guiding them instead of directly teaching (McClintic and Petty 2015). In addition, children's increased enthusiasm and learning motivated teachers to arrange more outdoor activities (Hill 2018; Puhakka et al. 2019). Here, the teacher's central role was not only a benefit but

a challenge too, especially with young children (Vartiainen et al. 2018). When learning outdoors, teachers needed to be available to support children's decision-making (Dowdell, Gray, and Malone 2011).

Several studies (Harris 2017; Hill 2018; Waite 2011) drew attention to teachers' competence and skills as beneficial to cultivating outdoor learning. A competent teacher is capable of awakening children's love and excitement of nature (Dowdell, Gray, and Malone 2011), even with children who tended usually to appear less interested in learning (Vartiainen et al. 2018). Hill (2018) found that teachers grew in their professional competence and learned from others when teaching outdoors. The nature programme increased teachers' leadership skills and enhanced their confidence and trust in children and colleagues (Vartiainen et al. 2018). Teachers felt that teaching outdoors required time management and a sense of self-transcendence (Tuuling, Öun, and Ugaste 2019).

It was apparent that teachers' lack of knowledge and motivation to use outdoor learning environments was perceived as a challenge. This sometimes led to teachers not exploiting the full potential and benefits of the outdoor environment (McClintic and Petty 2015). Teachers themselves attributed this to factors including lack of inclination (McClintic and Petty 2015; Waite 2011); preparation, planning and a sense that going outside into nature took too much time (Tuuling, Öun, and Ugaste 2019). Many teachers were used to teaching indoors and considered it convenient, and such a perspective was hard to change (Tuuling, Öun, and Ugaste 2019). This certainly poses a serious challenge in terms of implementing outdoor ECEC learning, as teachers would then be unable to acknowledge the holistic development of children resulting from outdoor learning (Dowdell, Gray, and Malone 2011; Tuuling, Öun, and Ugaste 2019).

The *Organisation of outdoor learning* category comprises five subcategories of benefits: *Space and equipment*; *Weather conditions*; *Parents' role in enhancing outdoor learning*; *Positive relationship to community*; and *Use of digital devices*. Equally, five subcategories of challenges were also recognised, with some overlap: *Space and equipment*; *Weather conditions*; *Parents' role in preventing outdoor learning*; *Administrative work*; and *Safety and prevention*. In terms of organising outdoor learning, it was evident that the natural environment provided space and equipment that benefitted different learning styles, enabling different activities (Tuuling, Öun, and Ugaste 2019). Harris (2017) notes that ample physical space without walls and ceilings is conducive to organising outdoor learning. Vartiainen et al. (2018) do not even consider that there is, necessarily, any requirement for any special learning equipment: the outdoor environment can offer hidden, partially enclosed and intimate places for children (Merewether 2015). It was felt that placing natural, green and health-promoting environments near childcare settings should be a shared interest among architectural designers, city planning, ECEC and health promoters (Mårtensson et al. 2009). Space and equipment, however, were considered to be a challenge, as well (Dyment and O'Connell 2013; McClintic and Petty 2015). Sometimes, outdoor learning areas were too far away or were lacking altogether (Tuuling, Öun, and Ugaste 2019). Teachers described a lack of resources (Waite 2011), necessary tools (McClintic and Petty 2015) or storage for tools (Tuuling, Öun, and Ugaste 2019). Furthermore, it was observed that noise and nearby traffic could complicate the effective implementation of outdoor learning activities (Tuuling, Öun, and Ugaste 2019).

The weather conditions were seen as a benefit *and* challenge. Changes in the weather and seasonal variations taught children to dress appropriately, and being outdoors

instilled in the children a practical approach to the weather (Dowdell, Gray, and Malone 2011; Puhakka et al. 2019). Children learned, too, about opportunities for weather-specific activities, such as the wind enabling kite flying and rainy weather making it easier to create things in sandpits (Dowdell, Gray, and Malone 2011). Sometimes, however, weather conditions could hinder making use of outdoor environments, rendering learning possibilities dependent on the season. Teachers felt that getting small children dressed to go outside was time-consuming, and some children did not have weather-appropriate clothes (McClintic and Petty 2015; Tuuling, Öun, and Ugaste 2019).

Cooperation between teachers and parents (Hill 2018), as well as other experts and the community (Vartiainen et al. 2018), benefitted the organisation of outdoor learning. Parents reported (Rymanowicz, Hetherington, and Larm 2020) that their children's outdoor programmes inspired them to make more ecological choices and increase their number of outdoor activities. Two studies also suggested that the community benefitted from having happy children outdoors (Rymanowicz, Hetherington, and Larm 2020; Waite 2011). The fact that sometimes the only opportunity for children to be outside was at preschool challenged the organisation of outdoor learning (Puhakka et al. 2019). To solve the challenge related to administrative work when establishing and operating forest school programmes, the teachers had to contact and build partnerships with community members, city officials, childcare centres, parents and insurance providers (Boileau and Dabaja 2020).

In terms of using digital devices to enhance outdoor learning, it was interesting to note that the devices were not only used to document children's activities and search for information (Puhakka et al. 2019) but also to support teachers' reflections and enable cooperation between teachers and parents (Vartiainen et al. 2018). Finally, safety and prevention entail risk perception, which can pose a challenge for outdoor learning when organising activities that involve risk, such as using tools such as knives, climbing trees and building fires (Tuuling, Öun, and Ugaste 2019). Children's safety is obviously a priority (McClintic and Petty 2015), and a large group can make outdoor learning challenging to arrange (Tuuling, Öun, and Ugaste 2019).

## Discussion

Undertaking a small, purposeful narrative synthesis of selected literature allowed us to address our aim of identifying and describing the benefits and challenges of outdoor learning implementation in ECEC. Notably, the analysis underscored the vital part that teachers play in making outdoor education and learning possible. It points to the importance of support in the form of teacher education and professional development, given the indications in some studies that teachers may not feel sufficiently equipped with the professional knowledge or understanding needed to implement outdoor learning. In addition, a substantial difficulty related to making use of outdoor learning environments lies in the fact that nature is not always available in the school vicinity, especially for educational settings that are in cities. However, if there is no nature or natural environment close to a school or daycare facility, one possible solution is for vegetation or other natural elements to be brought to the school playground or classroom, as some

studies suggest (Chawla 2015; Puhakka et al. 2019; Roslund et al. 2020). Ideally, though, schools and daycare centres should be built as close as possible to forests and parks, to allow easy access.

When examining the benefits and challenges evident from our narrative synthesis, we observed that not all categories encompassed opportunities and barriers. It became apparent, though, that there were certain common denominators in the implementation of education. These implementation-related elements of outdoor learning are visualised in Figure 1. It is hoped that this graphic presentation of categories and elements may assist educators, and others with a professional interest in this area, in reflecting on the essential boundary conditions that warrant consideration in outdoor learning. Although the focus in our inquiry is on ECEC, the elements could also be applicable within primary and secondary education, and even in higher education.

Figure 1 is thus offered as an illustrative tool depicting the benefits of outdoor learning for children’s education, as well as considering the challenges involved in operationalising an outdoor learning environment. This visualisation suggests the advantages of holistic

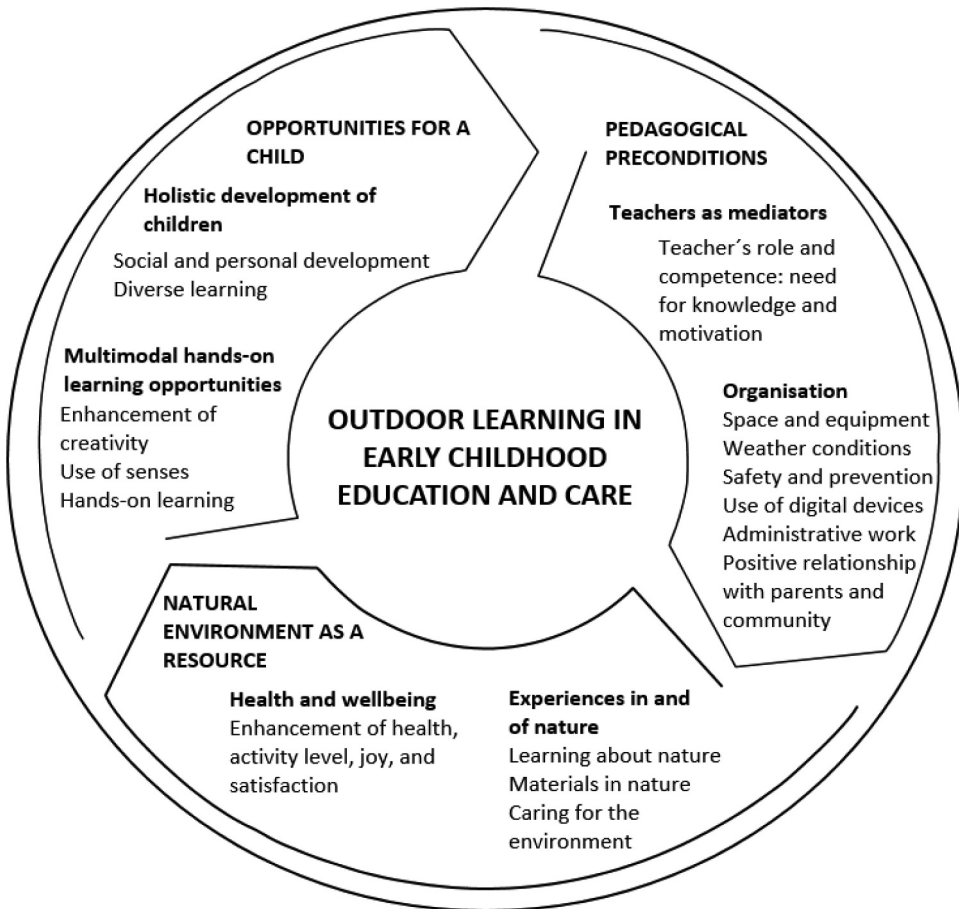


Figure 1. A visualisation of implementation-related considerations for outdoor learning in ECEC, based on the analysis.

and multimodal hands-on learning for children and also reminds us of the positive impact on their overall wellbeing that may occur when outdoor learning activities are well structured and carefully organised. One implication of our analysis is the idea that all schools and daycare facilities would benefit from being able to conduct some kind of outdoor learning part of educating children and young people. Furthermore, it would be helpful for outdoor learning, as a pedagogical approach, to be included in initial and in-service teacher education and development, as this would support its advancement as an opportunity for children and early-career teachers.

With this in mind, we suggest that outdoor ECEC learning has considerable potential application in future research endeavours and in both pre- and in-service teacher education and development. The categories presented in this study could potentially serve as valuable resources for such purposes. To further advance the field, subsequent investigations should consider delving more deeply into teachers' perspectives and viewpoints. Furthermore, given the pivotal role teachers play in implementing outdoor education, it appears that outdoor settings may have a positive impact on teachers' wellbeing, too (Hill 2018; Puhakka et al. 2019). Other findings related to the experiences of staff, children, students and their parents suggest that new research directions might include exploring how modern technology could be used to measure, for example, the effect of studying and working outdoors on participants' wellbeing.

### **Limitations**

The purpose of this narrative synthesis was to generate insight into the noted benefits and challenges concerning the implementation of outdoor ECEC learning. Based on a data set of 20 selected studies and using an approach based on abductive thematic content analysis (Elo et al. 2014; Grant and Booth 2009), we were able to construct a categorisation to describe features of outdoor learning implementation, which may be useful as a starting point when considering, planning and implementing outdoor learning, or as a stimulus for initial discussion about the notion of outdoor learning. As explained above, our study was intentionally a focused, in-depth analysis of a small subset of relevant literature: as such, it was constrained in scope. Indeed, one notable limitation of our study is its restricted geographic representation, and we acknowledge that incorporating more diverse studies would be necessary to broaden its scope, leading to a more comprehensive and large-scale review. It is important to note that the results are not intended to be generalisable. Different countries and jurisdictions will, doubtless, have varied practices related to climate conditions as well as safety- and culturally-related variations that need to be considered in greater detail when organising outdoor learning opportunities for ECEC.

### **Conclusion**

Research has drawn attention to the idea of outdoor environments as facilitators of ECEC learning (Amus 2013; Chawla et al. 2014). Our narrative synthesis of a subset of articles identifies evidence that outdoor learning has the potential to benefit children, especially in terms of multimodal, hands-on opportunities, and enhance their holistic development (Boileau and Dabaja 2020; Tuuling, Öun, and Ugaste 2019; Zamani 2016). It is notable that influential challenges in realising children's outdoor

learning were related to pedagogical preconditions, including teachers' capacity and preparedness to be in a position to arrange outdoor activities (Amus 2013; Henriksson 2018; Hill 2018). This emphasises the key role of teacher education and development: teachers need to be suitably supported and empowered to implement outdoor learning opportunities for children. Although resources, conditions and facilities were other constraints, it was clear that these were often regarded as surmountable (for example, weather conditions being handled with appropriate clothing (Dowdell, Gray, and Malone 2011; Puhakka et al. 2019), and/or the use of various weather conditions as resources in themselves (Dowdell, Gray, and Malone 2011)). In addition, the use of digital devices (Puhakka et al. 2019; Vartiainen et al. 2018) can have an important role in outdoor learning, such as in terms of finding more information about issues that interest children, and documenting activities and projects.

Overall, there was evidence to suggest that outdoor learning can enhance the health and wellbeing of children and staff (Lee et al. 2012; Puhakka et al. 2019), and even the wider community (Rymanowicz, Hetherington, and Larm 2020; Waite 2011). The apparent benefits for children and staff in ECEC may also apply in primary, secondary and higher and lifelong education. It must be noted that sustainable development and ecological viewpoints are central concepts in learning outdoors, enhancing children's appreciation of nature and environmental awareness (Boileau and Dabaja 2020; Dowdell, Gray, and Malone 2011; see also Ernst et al. 2021; Harvey et al. 2020). A significant, wider point for future work relates to the idea that practical, realistic solutions are needed to support children's and adults' mental and physical wellbeing. In this sense, perhaps outdoor learning in the broadest sense could help with some of the current challenges to improve population-level health outcomes – for example, the long-term health risks associated with a sedentary lifestyle.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This study was supported by the Ministry of Culture and Education in Finland and the InnoPlay 2018–2022 Project.

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## References

- \*Almers, E., P. Askerlund, T. Samuelsson, and S. Waite. 2020. "Children's Preferences for Schoolyard Features and Understanding of Ecosystem Service Innovations – a Study in Five Swedish

- Preschools." *Journal of Adventure Education and Outdoor Learning* 21 (3): 230–246. <https://doi.org/10.1080/14729679.2020.1773879>.
- Amus, G. 2013. "An alternative journey into forest kindergartens and the Reggio Emilia approach." In *Reorientation of teacher education towards sustainability through theory and practice. Proceedings of the 10th international JTEFS/BCC conference Sustainable development*, edited by U. Härkönen, 5–26. Education: University of Eastern Finland.
- \*Boileau, E., and Z. Dabaja. 2020. "Forest School Practice in Canada: A Survey Study." *Journal of Outdoor & Environmental Education* 23 (3): 225–240. <https://doi.org/10.1007/s42322-020-00057-4>.
- Chawla, L. 2015. "Benefits of Nature Contact for Children." *Journal of Planning Literature* 30 (4): 433–452. <https://doi.org/10.1177/0885412215595441>.
- Chawla, L., K. Keena, I. Pevec, and E. Stanley. 2014. "Green Schoolyards as Havens from Stress and Resources for Resilience in Childhood and Adolescence." *Health & Place* 28:1–13. <https://doi.org/10.1016/j.healthplace.2014.03.001>.
- \*Dowdell, K., T. Gray, and K. Malone. 2011. "Nature and Its Influence on Children's Outdoor Play." *Journal of Outdoor & Environmental Education* 15 (2): 24–35. <https://doi.org/10.1007/BF03400925>.
- Dyment, J. E. 2005. "Green School Grounds as Sites for Outdoor Learning: Barriers and Opportunities." *International Research in Geographical & Environmental Education* 14 (1): 28–45. <https://doi.org/10.1080/09500790508668328>.
- \*Dyment, J., and T. S. O'Connell. 2013. "The Impact of Playground Design on Play Choices and Behaviors of Pre-School Children." *Children's Geographies* 11 (3): 263–280. <https://doi.org/10.1080/14733285.2013.812272>.
- Elo, S., M. Kääriäinen, O. Kanste, T. Pölkki, K. Utriainen, and H. Kyngäs. 2014. "Qualitative Content Analysis: A Focus on Trustworthiness." *SAGE Open* 4 (1): 215824401452263. <https://doi.org/10.1177/2158244014522633>.
- Ernst, J., K. McAllister, P. Siklander, and R. Storli. 2021. "Contributions to Sustainability Through Young Children's Nature Play: A Systematic Review." *Sustainability* 13 (13): 7443. <https://doi.org/10.3390/su13137443>.
- FNBE. 2022. *Finnish National Board of Education, National Core Curriculum for Early Childhood Education and Care 2022*. Helsinki: FNBE.
- Fuller, C., D. Powell, and S. Fox. 2017. "Making Gains: The Impact of Outdoor Residential Experiences on students' Examination Grades and Self-Efficacy." *Educational Review* 69 (2): 232–247. <https://doi.org/10.1080/00131911.2016.1199538>.
- Grant, M., and A. Booth. 2009. "A Typology of Reviews: An Analysis of 14 Review Types and Associated Methodologies." *Health Information and Libraries Journal* 26 (2): 91–108. <https://doi.org/10.1111/j.1471-1842.2009.00848.x>.
- Haahtela, T. 2019. "A Biodiversity Hypothesis." *Allergy* 74 (8): 1445–1456. <https://doi.org/10.1111/all.13763>.
- \*Harris, F. 2017. "Outdoor Learning Spaces: The Case of Forest School." *Area* 50 (2): 222–231. <https://doi.org/10.1111/area.12360>.
- Hartmeyer, R., M. P. Stevenson, and P. Bentsen. 2016. "Evaluating Design-Based Formative Assessment Practices in Outdoor Science Teaching." *Educational Research* 58 (4): 420–441. <https://doi.org/10.1080/00131881.2016.1237857>.
- Harvey, D. J., L. N. Montgomery, H. Harvey, F. Hall, A. C. Gange, and D. Watling. 2020. "Psychological Benefits of a Biodiversity-Focussed Outdoor Learning Program for Primary School Children." *Journal of Environmental Psychology* 67:101381. <https://doi.org/10.1016/j.jenvp.2019.101381>.
- Henriksson, A. C. 2018. "Primary School teachers' Perceptions of Out of School Learning within Science Education." *LUMAT: International Journal on Math, Science and Technology Education* 6 (2): 9–26. <https://doi.org/10.31129/LUMAT.6.2.313>.
- \*Hill, V. 2018. "Learning in Nature: Leadership Opportunities in an Education Outside the Classroom Programme in a New Zealand Early Childhood Centre." *Journal of Educational Leadership, Policy and Practice* 33 (1): 32–45. <https://doi.org/10.21307/jelpp-2018-004>.
- Kaasinen, A. 2019. "Plant Species Recognition Skills in Finnish Students and Teachers." *Education Sciences* 9 (2): 85. <https://doi.org/10.3390/educsci9020085>.

- Kiewra, C., and E. Veselack. 2016. "Playing with Nature: Supporting Preschoolers' Creativity in Natural Outdoor Classrooms." *The International Journal of Early Childhood Environmental Education* 4 (1): 70–95. <https://eric.ed.gov/?id=EJ1120194>.
- Kuo, M., M. Barnes, and C. Jordan. 2019. "Do Experiences with Nature Promote Learning? Converging Evidence of a Cause-And-Effect Relationship." *Frontiers in Psychology* 10:305. <https://doi.org/10.3389/fpsyg.2019.00305>.
- Lee, J., Q. Li, L. Tyrväinen, Y. Tsunetsugu, B. J. Park, T. Kagawa, and Y. Miyazaki. 2012. "Nature Therapy and Preventive Medicine". In *Public Health. Social and Behavioral Health*, edited by J. Maddock, 325–350. <https://doi.org/10.5772/37701>.
- \*Mårtensson, F., C. Boldemann, M. Söderström, M. Blennow, J. E. Englund, and P. Grahn. 2009. "Outdoor Environmental Assessment of Attention Promoting Settings for Preschool Children." *Health & Place* 15 (4): 1149–1157. <https://doi.org/10.1016/j.healthplace.2009.07.002>.
- Maynard, T., and J. Waters. 2007. "Learning in the Outdoor Environment: A Missed Opportunity?" *Early Years* 27 (3): 255–265. <https://doi.org/10.1080/09575140701594400>.
- \*McClintic, S., and K. Petty. 2015. "Exploring Early Childhood teachers' Beliefs and Practices About Preschool Outdoor Play: A Qualitative Study." *Journal of Early Childhood Teacher Education* 36 (1): 24–43. <https://doi.org/10.1080/10901027.2014.997844>.
- \*Merewether, J. 2015. "Young Children's Perspectives of Outdoor Learning Spaces: What Matters?" *Australasian Journal of Early Childhood* 40 (1): 99–108. <https://doi.org/10.1177/183693911504000113>.
- \*Nedovic, S., and A. M. Morrissey. 2013. "Calm Active and Focused: Children's Responses to an Organic Outdoor Learning Environment." *Learning Environment Research* 16 (2): 281–295. <https://doi.org/10.1007/s10984-013-9127-9>.
- Olliff-Cooper, K., T. Raymond, C. Lawler, and K. Stables. 2021. "Designerly Play and the Mud Pool: Using Designerly Play as a Lens to View Young Children Experiencing Forest School." *Techne Series: Research in Sloyd Education and Craft Science A* 28 (2): 166–172. <https://journals.oslomet.no/index.php/techneA/article/view/4367/3858>.
- \*Puhakka, R., O. Rantala, M. I. Roslund, J. Rajaniemi, O. H. Laitinen, A. Sinkkonen, and The ADELE Research Group. 2019. "Greening of Daycare Yards with Biodiverse Materials Affords Wellbeing, Play and Environmental Relationships." *International Journal of Environmental Research and Public Health* 16 (16): 2948. <https://doi.org/10.3390/ijerph16162948>.
- \*Robertson, N., A. M. Morrissey, and D. Moore. 2020. "From Boats to Bushes: Environmental Elements Supportive of Children's Sociodramatic Play Outdoors." *Children's Geographies* 18 (2): 234–246. <https://doi.org/10.1080/14733285.2019.1630714>.
- Roslund, M. I., R. Puhakka, M. Grönroos, N. Nurminen, S. Oikarinen, A. M. Gazali, O. Cinek, et al. 2020. "Biodiversity Intervention Enhances Immune Regulation and Health-Associated Commensal Microbiota Among Daycare Children." *Science Advances* 6 (42): 2578. <https://doi.org/10.1126/sciadv.aba2578>.
- \*Rymanowicz, K., C. Hetherington, and B. Larm. 2020. "Planting the Seeds for Nature-Based Learning: Impacts of a Farm- and Nature-Based Early Childhood Education Program." *The International Journal of Early Childhood Environmental Education* 8 (1): 44–63. <https://eric.ed.gov/?id=EJ1280494>.
- Sajady, M., A. L. Gower, M. McCullough, and C. Jordan. 2020. "More Than a View: School Landscape Features are Associated with Improved Student Adjustment." *Journal of Developmental & Behavioral Pediatrics* 41 (6): 436–442. <https://doi.org/10.1097/DBP.0000000000000809>.
- \*Sando, O. J., and E. B. H. Sandseter. 2020. "Affordances for Physical Activity and Well-Being in the ECEC Outdoor Environment." *Journal of Environmental Psychology* 69:101430. <https://doi.org/10.1016/j.jenvp.2020.101430>.
- Sandseter, E. B. H., and O. B. Lysklett. 2018. "Outdoor Education in the Nordic Region." In *International Handbook of Early Childhood Education*, edited by M. Fleer and B. Oers, 889–905. Dordrecht: Springer.
- \*Sandseter, E. B. H., R. Storli, and O. J. Sando. 2020. "The Dynamic Relationship Between Outdoor Environments and Children's Play." *Education 3-13* 50 (1): 97–110. <https://doi.org/10.1080/03004279.2020.1833063>.

- Simkin, J., A. Ojala, and L. Tyrväinen. 2020. "Restorative Effects of Mature and Young Commercial Forests, Pristine Old-Growth Forest and Urban Recreation Forest - a Field Experiment." *Urban Forestry & Urban Greening* 48:126567. <https://doi.org/10.1016/j.ufug.2019.126567>.
- Snyder, H. 2019. "Literature Review as a Research Methodology: An Overview and Guidelines." *Journal of Business Research* 104:333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>.
- \*Tuuling, L., T. Öun, and A. Ugaste. 2019. "Teachers' Opinions on Utilizing Outdoor Learning in the Preschools of Estonia." *Journal of Adventure Education and Outdoor Learning* 19 (4): 358–370. <https://doi.org/10.1080/14729679.2018.1553722>.
- Tuunanen, P., M. Tarasti, and A. Rautiainen. 2015. *Everyman's Rights and the Code of Conduct on Private Land. Existing Legislation and Suggestions for Best Practices*. Helsinki: Ministry of the Environment.
- Tyrväinen, L., A. Ojala, K. Korpela, T. Lanki, Y. Tsunetsugu, and T. Kagawa. 2014. "The Influence of Urban Green Environments on Stress Relief Measures: A Field Experiment." *Journal of Environmental Psychology* 38:1–9. <https://doi.org/10.1016/j.jenvp.2013.12.005>.
- Ulrich, R. S., R. F. Simons, B. D. Losito, E. Fiorito, M. Miles, and M. Zelson. 1991. "Stress Recovery During Exposure to Natural and Urban Environments." *Journal of Environmental Psychology* 11 (3): 201–230. [https://doi.org/10.1016/S0272-4944\(05\)80184-7](https://doi.org/10.1016/S0272-4944(05)80184-7).
- \*Vartiainen, H., S. Nissinen, S. Pöllänen, and P. Vanninen. 2018. "Teacher's Insights into Connected Learning Networks: Emerging Activities and Forms of Participation." *AERA Open* 4 (3): 1–17. <https://doi.org/10.1177/2332858418799694>.
- von Hertzen, L., I. Hanski, and T. Haahtela. 2011. "Natural Immunity. Biodiversity Loss and Inflammatory Diseases are Two Global Megatrends That Might Be Related." *EMBO Reports* 12 (11): 1089–1093. <https://doi.org/10.1038/embor.2011.195>.
- \*Waite, S. 2011. "Teaching and Learning Outside the Classroom: Personal Values, Alternative Pedagogies and Standards." *Education 3-13* 39 (1): 65–82. <https://doi.org/10.1080/03004270903206141>.
- \*Yildirim, G., and G. Ö. Akamca. 2017. "The Effect of Outdoor Learning Activities on the Development of Preschool Children." *South African Journal of Education* 37 (2): 1–10. <https://doi.org/10.15700/saje.v37n2a1378>.
- Yliverronen, V. 2014. "From Story to Product: Pre-schoolers' Designing and Making Processes in a Holistic Craft Context." *Design and Technology Education: An International Journal* 19 (2): 1360–1431. <https://urn.fi/URN:NBN:fi-fe2021042714168>.
- \*Zamani, Z. 2016. "'the Woods is a More Free Space for Children to Be Creative; Their Imagination Kind of Sparks Out there': Exploring Young Children's Cognitive Play Opportunities in Natural, Manufactured and Mixed Outdoor Preschool Zones." *Journal of Adventure Education and Outdoor Learning* 16 (2): 172–189. <https://doi.org/10.1080/14729679.2015.1122538>.

## Appendix A.

**Table A1.** Studies included in the narrative synthesis.

Author and date	Title	Country	Main participants and methods
Almers et al. (2020)	<i>Children's preferences for schoolyard features and understanding of ecosystem service innovations: A study in five Swedish preschools</i>	Sweden	23 children (4 years); qualitative
Boileau and Dabaja (2020)	<i>Forest school practice in Canada: A survey study</i>	Canada	25 staff; qualitative
Dowdell et al. (2011)	<i>Nature and its influence on children's outdoor play</i>	Australia	12 children (2–6 years); qualitative
Dyment and O'Connell (2013)	<i>The impact of playground design on play choices and behaviours of preschool children</i>	Australia	children (preschool); qualitative
Harris (2017)	<i>Outdoor learning spaces: The case of forest school</i>	United Kingdom	72 children (4–11 years), 20 staff; qualitative
Hill (2018)	<i>Learning in nature: Leadership opportunities in an education outside the classroom programme in a New Zealand early childhood centre</i>	New Zealand	9 children (4 years), 5 staff, parents; mixed method
McClintic and Petty (2015)	<i>Exploring early childhood teachers' beliefs and practices about preschool outdoor play: A qualitative study</i>	United States of America	11 staff; qualitative
Merewether (2015)	<i>Young children's perspectives of outdoor learning spaces: What matters?</i>	Australia	8 children (3–4 years); qualitative
Mårtensson et al. (2009)	<i>Outdoor environmental assessment of attention promoting settings for preschool children</i>	Sweden	198 children (4.5–6.5 years); quantitative
Nedovic and Morrissey (2013)	<i>Calm active and focused: Children's responses to an organic outdoor learning environment</i>	Australia	18 children (3–4 years), 3 staff; qualitative
Puhakka et al. (2019)	<i>Greening of daycare yards with biodiverse materials affords wellbeing, play and environmental relationships</i>	Finland	13 staff (children 3–5 years), 49 parents; qualitative
Robertson et al. (2020)	<i>From boats to bushes: Environmental elements supportive of children's sociodramatic play outdoors</i>	Australia	30 children (4–5 years), 5 staff; quantitative
Rymanowicz et al. (2020)	<i>Planting the seeds for nature-based learning: Impacts of a farm- and nature-based early childhood education program</i>	United States of America	33 parents; mixed methods
Sando and Sandseter (2020)	<i>Affordances for physical activity and wellbeing in the ECEC outdoor environment</i>	Norway	73 children (3–4 years); mixed methods
Sandseter et al. (2020)	<i>The dynamic relationship between outdoor environments and children's play</i>	Norway	86 children (3–6 years); mixed methods
Tuuling et al. (2019)	<i>Teachers' opinions on utilising outdoor learning in the preschools of Estonia</i>	Estonia	490 staff; qualitative
Vartiainen et al. (2018)	<i>Teacher's insights into connected learning networks: Emerging activities and forms of participation</i>	Finland	29 staff; qualitative
Waite (2011)	<i>Teaching and learning outside the classroom: Personal values, alternative pedagogies and standards</i>	United Kingdom	children (2–11 years), staff; mixed methods
Yildirim and Akamca (2017)	<i>The effect of outdoor learning activities on the development of preschool children</i>	Turkey	35 children (5 years); quantitative
Zamani (2016)	<i>The woods are a more free space for children to be creative; their imagination kind of sparks out there': Exploring young children's cognitive play opportunities in natural, manufactured and mixed outdoor preschool zones</i>	United States of America	22 children (4–5 years), 4 staff; qualitative