

## **How has social educators' practice with the UN's Global Goals for Sustainable Development developed from 2015 to 2022 in Scandinavian outdoor kindergartens?**



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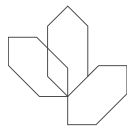


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### **ABSTRACT**

This review is based on a systematic analysis of international peer-reviewed research articles from year 2015-2019, and Scandinavian articles from 2020-2022 on education of sustainable development in kindergartens. The aim is to provide an overview of the development in kindergarten practice concerning sustainable development. The results show, how a pattern of collective focus can be seen in Scandinavian practice which further develops into a social-cultural collaborative process with a focus on place-based sustainable education and active participating children. The results point toward a need for further dialogue on the concept of education for sustainability development. Results show a pattern of collective focus in Scandinavia, with highly motivated social educators being interested in developing educational knowledge and skills in sustainable development. This develops into a social-cultural collaborative process with focus on actively participating children and



place-based education. This may be due to an unreflected common-sense practice. Patterns of different priorities in practice are seen, such as to which degree the social educators consciously apply social-cultural tradition, collaborations in local environments for sustainable development, method of work, cultural understanding, content, and organization.

## KEYWORDS

*Early childhood education, outdoor, Scandinavian, sustainable development.*

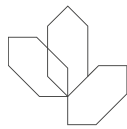
## 1. INTRODUCTION

As professionals in Scandinavian kindergartens, social educators are a part of children's education on a common future and sustainable development. In this way, social educators become key persons in early childhood education. About 50% of children in the world receive care and education in early childhood settings, which include kindergartens [1]. This paper focuses on the development of Education for Sustainable Development (EfSD) and Early Childhood Education for Sustainable Development (ECEfSD) in outdoor kindergartens in Scandinavia in the periods 2015–2019 and 2020–2022; and is based on peer-reviewed articles on outdoor pedagogy. Often, an alignment between working in outdoor kindergartens and working with education for sustainability is expressed. In this review, we wish to challenge this understanding. How do social educators work in outdoor kindergarten practise education for sustainability? And how has practice developed from 2015 to 2022 in Scandinavia?

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### 1.1. OUTDOOR KINDERGARTENS IN SCANDINAVIA

Outdoor refers to something big given around man, such as nature, but also to be out of doors, i.e., under open sky or outside the house. Outdoor is not the same as nature but rather an interweaving of nature and culture. The outdoor in pedagogy is connected to experiences, sensory input, and compassion on different levels, outdoor education and learning in educational activities that take place outside the door.



'Outdoor kindergarten' is a broad term with no exact definition [2]. The term is mostly an institutional self-perception. It is related to the purpose of pedagogical activities and the understanding of nature. Understanding nature is essential for the use of outdoor environment in kindergartens [3]. The time children spend outdoor, and its duration have variations from three to five hours daily to all day, all-year around, and in all weather. Young Scandinavian children spend their awoken time in kindergarten every day [4,5]. They start in primary school at around seven years. The nature of the physical environment is central [6-7], the physicality of surroundings is considered to support children's play, education, and learning. The physical surroundings outside the door are supplied with pedagogical attention, e.g., to the change of seasons; and sensory awareness is considered as an essential prerequisite for both spontaneous and planned play, education, and learning for young children.

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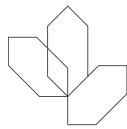
## **1.2. SOCIAL EDUCATORS' PROFESSIONAL IDENTITY**

Social educators are endorsed with a professional identity to educate and facilitate children in kindergartens in an increasingly active and participative co-productive role, with a global mindset to educate and facilitate children in kindergartens. The intention is to give children the possibility for active participation in co-productive collaboration in local communities on 'how to do' EfSD. Activities in EfSD are often described as a collective, crosscut with a major purpose to promote children's active participation processes and with children's initiatives in focus [8]. Social educators' knowledge of nature and the environment is limited [9] and their understanding of nature and sustainable development is seen as 'simple and romantic' [9] p.(981). This is reflected in an understanding that children who spend a certain time outdoors automatically become more interested in the future of their surroundings [9].

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## **1.3. SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT**

Sustainability is an extremely broad and complex concept, often referred to as Our Common Future, with an aim to propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond [10]. In journals, the scope of the UN 17 SDG appears as a complex field with several goals that relate to social education [11]. In the Intergovernmental Panel on Climate Change's (IPCC) Climate Change 2014 Synthesis Report 5, sustainability is defined as 'a dynamic



process that guarantees the persistence of natural and human systems in an equitable manner'. Sustainable development is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' [12] (pp.127-128). The relevant and current issue of sustainable development is an effect of the Anthropocene era [13], where human activities have resulted in an overconsumption of the earth's natural resources, which we must act upon [14].

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#### **1.4. A HISTORICAL BACKGROUND OF SUSTAINABLE EARLY CHILDHOOD EDUCATION**

Growth in interest and research has been seen after Julia Davis's (2009) survey: 'Revealing the Research "Hole" of Early Childhood Education for Sustainability'. Davis pointed out that education for sustainability was scarce in the kindergarten area. She highlighted the conceptualisation towards a transformative preschool education that values, encourages and supports children as problem seekers, analytical people, and activists around sustainability issues and topics related to their own lives [15]. Overall, there has been a transformation from education *about* environments to education *in* environments *about* environments to education *about* sustainability to increasingly transformative education *in* the environment *for* sustainable development and *with* humans.

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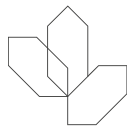
#### **1.5. INCREASING INTEREST AND REFOCUSING PROCESSES**

So, an increasing research interest in the field of sustainability in early childhood education, together with a refocusing process started. This process was framed by intertwined issues of global environmental, social, and economic problems [16]. The increasing interest and need for innovative ideas on 'how to do' in practice by social educators of ECEfSD may be attributed to the United Nations (UN) body of the IPCC report from 2014 [12].

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#### **1.6. REFOCUSING EARLY CHILDHOOD AND EARLY CHILDHOOD EDUCATION**

The development of children and their active participation is focused on in Article 12 in the UN's Convention on the Rights of the Child, where respect for children's views and children's democratic are highlighted. In addition, the United Nations



Educational, Scientific and Cultural Organization (UNESCO) points out as a learning objective, 'The learner understands the important role of culture in achieving sustainability' [17] (p.22).

There ongoing dialogue on how the practice of ECEfSD may turn towards a more active participation for all children. In this field, there is limited knowledge, too, about how social educators in practice work with Sustainable Development Goals (SDGs), especially in outdoor kindergartens [18]. Based on this introduction, our research question is:

**How has social educators' practice with the UN's Global Goals for Sustainable Development developed from 2015 to 2022 in Scandinavian outdoor kindergartens?**

## **2. MATERIALS AND METHODS**

With the purpose of revealing development in the understanding and practice of social educators' work with sustainability in outdoor kindergartens, this literature review, is an identification of published material that provides insight into current research. There is a starting point in the research question, followed by analysis with a critical eye, a narrative report and a thematic analysis. The review takes starting point in a systematic database search of peer-reviewed article research from 2015–2019 and 2020–2022. Due to databases discontinued during the period there are used slightly different databases (see Table 1.). In 2020–2022, only papers concerning Scandinavia were included. The review was supplemented with a search and full reading of articles selected and recommended by research colleagues in the Research Centre for Pedagogy and Education/outdoor pedagogy, VIA University College, Denmark. The field is regarded as an analytic field of the research questions [19]. It is a systematic review of primarily existing English and Scandinavian peer-reviewed articles, aiming to give an overview and uncover gaps in the field [20] (p. 111). Keywords, phrases, boundaries and contextual aspects in the database and supplements are Participants (P), Context (C) and Content (C) (PCC). A search strategy was produced to frame the questions and to sort relevant in- and exclusive criteria for this qualitative review [20] (p. 111).

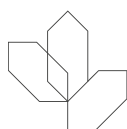
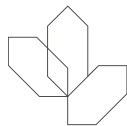


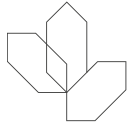
Table 1. PCC inclusion and exclusion criteria and methods for articles in the database search and supplements 2015–2022

	Inclusion	Exclusion
<b>Participants</b>	Social educators, teachers	2015–2022 schools, primary schools 2020–2022 authors from Scandinavia travelling to foreign countries
<b>Content</b>	Outdoor, daily pedagogical activities/processes in kindergarten, outdoor and science, open-air spaces	Indoor, articles based on both Scandinavian and non-Scandinavian participants
<b>Context</b>	Kindergarten/preschools/børnehavebørn, early childhood education, USA, UK, AU, Europe, OECD countries, and 2020–2022 only Scandinavian, (Norway, Sweden, and Denmark) 2015–2019 articles recommended by colleagues Outdoor AND pedagogy OR educational	2015–2022 children over 6 years Period: articles before 2015 and after March 2022
<b>Methods</b>	Literature analysis, meta-analysis, ethnographic fieldwork, and cultural analysis	2020–2022 articles combining data from kindergartens and primary school context



		<p>2020–2022 articles without described research methods</p> <p>2020–2022 articles on developmental practice experiment but not implemented in practice</p>
<b>Articles</b>	Peer-reviewed articles	Non-peer-reviewed articles, conference paper, book chapters
<b>Languages</b>	<p>2015–2019 articles in English, Norwegian, Swedish, and Danish</p> <p>2020–2022 articles in English</p>	Articles in other languages

The keywords, synonyms and phrases are translated from Danish to English. English keywords were also searched with Danish, Swedish and Norwegian keywords in Scandinavian databases for the period 2015–2019. A search in different databases of peer-reviewed articles was conducted. English keywords used in aspect search in databases are (1) kindergarten\* or preschool\* or daycare or prekindergarten\*\* or ‘early childhood education’, (2) outdoor\* or science\* or ‘preschool science’\*\* and (3) ‘Sustainable Development Goals’ or SDG or sustain\*.



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## **2.1. SELECTED DATABASES AND OTHER JOURNALS**

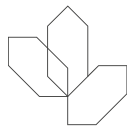
The following are databases selected for the period 2015–2019:

- Eric
- Skandinavisk forskning på dagtilbuds-området [Scandinavian Kindergarten Research]
- Forsknings-database.dk [Danish Research Database]
- Bibliotek.dk - fritekst [Danish Library System]
- Idunn
- FSWE-Pub
- Oria BIB sys
- <http://www.diva-portal.org/>
- Google Scholar advanced
- Google Scholar
- The subjectively selected literature was [9,16] [21,22,23,24,25].

The following are databases selected for the period 2020–2022:

- Eric
- Eric - Green File
- Idunn
- [www.DIVA-portal.org/](http://www.DIVA-portal.org/).
- UC-viden [Danish University College Database]
- Skandinavisk forskning på dagtilbuds-området [Scandinavian Research Database Early Childhood Education]
- DPU Småbørnsliv i dagtilbud [Research in Danish School of Education Database in Early Childhood Education]
- [www.SemanticScholar.org](http://www.SemanticScholar.org)
- SCOPUS





*See Appendix 2.1.1. Table 2. Search history for documentation of searches*

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## **2.2. CRITIQUE**

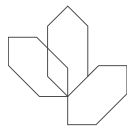
There are limitations to this review. It is possible to go in further detail on the quality of the included articles. There were limitations on language. Two databases used in 2015–2019 had ceased, and new ones were used. There is a different national vocabulary in the field. The systematic search changed from 2015–2019 to 2020–2022, from a broad international context to a Scandinavian context. The search in 2020–2022 was limited to the English language; see Table 1.

In the 2015–2019 search, it was difficult to see a clear pattern or direction overall. It was like opening a wide range of different interests, directions and suggestions. However, the analysis of 2015–2019 articles designated qualitatively and quantitatively in the direction of Scandinavia as a lead. The articles from Scandinavia focused on the collective resource, the interpersonal dialogue, the sociocultural and outdoor traditions, democratic education and the children’s own participative development of a global mindset as active citizens in local changing processes. The 2015–2019 articles had a significant part in total (11 of 34) provenance in Scandinavia as Figure 1 illustrates, which invited a search on what is developing in the field for Scandinavia in particular. This led to a reduction in geographic context in Scandinavia, on how the collective resource approach developed further in 2020–2022. Surprisingly, few peer-reviewed articles ( $n=5$ ) were included in the 2020–2022 search. Exclusion criteria were a part of these limitations, e.g., exclusion of articles combining data from kindergartens and primary school context and the reduction to English language and the content outdoor. Researchers from the Research Centre for Pedagogy and Education outdoor program, VIA University College, have followed the process; critically reading methods, analysis strategy, and content and discussed and suggested a few articles and the structure of this review.

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## **2.3. TECHNIQUES**

The search history for documentation of searches was systematically with entry and with ongoing notes on choice. In this form, notes included why articles were excluded



as they did not address the focus PCC areas selected, e.g., a conference paper, a duplet or a book chapter.

2015–2019: Search: 128, excluded by title: 18, included for abstract reading: 111 articles (n=111), 82 articles excluded after abstract reading. Full-text reading n=29, five articles excluded due to inclusion criteria concerning quality.

Abstract read on 111 articles (n=111); later reduced to 29 (n=29), 29 read in full text, and there was no further exclusion; thereafter, 10 (n=10) articles were selected from other sources and researchers in the field, and these were read in full text and reduced to 5 (n=5). The number of articles in the review was 34 (n=34); see appendix.

2020–2022: Search: n=6455, excluded by title and PCC, n=6429, reduced by date range and citation. Included for abstract reading: 26 articles (n=26). Journals excluded after abstract reading: 19 (n=9), full-text reading n=9. Five articles excluded due to inclusion criteria concerning quality n=4. The number of journals in the systematic review was 4 (n=4); see appendix.

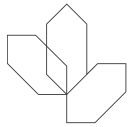
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#### **2.4. ANALYSIS**

To reveal the overview, discrepancies and dilemmas, an anthropological analysis was chosen [26]. In anthropological analysis, the researcher interprets the voices of the authors through perspectives [27]. The coding process took place as an interpretation, like an analytic processual movement, which begins with

1. registration of statements in the texts by full reading, followed by
2. open coding that interprets what is at stake in the text; interpretation continues with
3. focusing themes the texts deal with; focus areas are finally gathered into
4. overall and significant meaning patterns for all included texts.

The analysis process is an iterative process with continuous narrowing, from registration, open coding and to processes of focused coding and exploration of relevant themes that are analysed with a critical eye, aiming to find cracks of dilemmas and inconsistencies in the pedagogical practice of the field [27]. The



analytic process results for 2015–2019 are presented in Figure 1 and 2020–2022 in Figure 2, an overall illustration on problems in the field in Figure 3.

### **3. RESULTS**

The analysis of the included papers is presented with findings concerning social educators' performed practice and their views on ECEfSD. Combined, they show the main challenges of the field, which will be elaborated in the following. As the review covers eight years, a development can be seen during the period.

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#### **3.1. CHARACTERISTICS OF THE DESCRIBED PRACTICE**

The pedagogical practice described in 2015–2019 is characterised by an absence of a particular education and practical approach to the field. In this way, no distinct education seems to dominate; the situation can be described as a preoccupation around multiple responses to broad questions (Do you know what sustainability means? Do you know what sustainable development means and how to practise it? [23], [28] (p. 363). Many authors also present proposals for refocusing and new practices in the field.

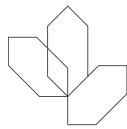


Figure 1. Overview of the characteristics of the described and prescribed practice, 2015–2019.

Findings	In articles
Unreflected nature experiences focus mostly on sensory experiences outdoors:	[8, 9, 22, 25,28, 29,30, 31, 32]
Aesthetic educational processes:	[8,25,33,34]
Mindfulness/beauty of nature/mental feelings:	[24,29,35]
Eco-friendly, e.g., horticultural/agricultural experiences:	[25,28,36,37,38]
Children’s play and curiosity:	[8,25, 30,34,38]
Encourage collective environmentally friendly actions:	[1,22, 30,36,40]
Promote a moral and individual-orientated responsibility:	[25,31,40,41]
Leading resource in sustainable development is cultural-social:	[1,24,30,37]
The child as an actor in an empowerment transformer process:	[9,22,28]
Educate on environmental issues vs protecting the child’s mind from the challenges in the real world, developing critical sense.	[36]
Even if social educators are highly motivated for ESD, there’s a lack of structured framework conditions in the practical activities:	[16,22,23,24,25,28, 30,31,34,35,36,39]

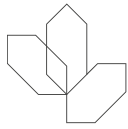


Figure 1 displays how the described practice in 34 articles including 11 articles from Scandinavia presents a wide range of different practices and approaches. The described practice encompasses different activities, all described as promoting sustainability [35,36]. The span is from nature activities with no clear intention of emphasising sustainability to intentions to create a mental positive feeling by using nature mindfulness and eco-friendly gardening activities. There are cultural and national differences in the journals examined on practice described, didactic and practical approach to the field. Experience, processes and education are understood as approaches to development; they can either be collective or individual responsibilities or take another major focus, which are based on different understandings of philosophy, ethics and didactic in practice concerning ECEfSD.

The characteristics and changes in 2015–2022 begin with unreflected nature experiences focusing mostly on sensory experiences, with a widespread notion leading people to learn to act on nature by perceiving nature experiences [23]. This basic assumption of the connection between nature and sensory experiences started around 1980-1990 as a strong conviction among Scandinavian social educators [6]. This is, according to an anthropocentric view of nature, as if nature exists primarily for human beings [23]. Social educators are led by the notion that spending a few hours outdoors daily or weekly, with direct experience of natural phenomena and elements, will enhance environmental awareness [8]. This time spent in nature is combined with the educators positioning themselves close to the children, choosing a monodisciplinary biological approach to life cycles of plants and animals in a child-orientated manner [8]. This practice is considered as sufficient education in sustainable development. But sustainability was not often chosen as a starting point for activities [8]. If the children actively play and experience outdoors and in nature, it is often taken for granted that there is no reason imagined for further actions in enrolling sustainability in the practised curriculum. Nor in the few examples of horticulture were activities focused on sustainability registered [35,42]. In the material, a significant pattern revealed is that pedagogy in the subject area is mostly characterized by giving the children sensory input. Social educators are keypersons in ECEfSD.

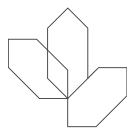
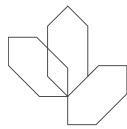


Figure 2. Overview of the characteristics of the described and prescribed practice, 2020–2022.

Findings	In articles
Unreflected nature experiences focus mostly on sensory experiences outdoors: Critic on unreflected taken-for-granted common practice.	[41]
Aesthetic processes are described as a decisive pedagogical method tool:	[41,44]
Children’s play and curiosity:	[41,45]
Educate on environmental issues, developing critical sense. None of the articles had focus on this field explicit; the results show a higher degree of balanced coordination in this dilemma in practice. Place-responsive education processes.	[43,44,45]
Encourage collective environmentally friendly actions: This field is not emphasised as a specific area but implicit.	[41,44,45,46]
Leading resource in sustainable development is cultural-social:	[45,46]
Processes in a cultural-social identity based on traditions in foraging and horticultural activities in local communities	[45]
It is an implicit practice to apply a scientific approach using a scientific mindset, as a dichotomic tradition, often are divided into either or Nature or Human science. This dichotomy is often taken for granted in Western culture. This dichotomic approach are seen as a dynamic process with ambiguities and cracks and opportunities to inclusion.	[41,44]



<p>Place-responsive educational processes.</p>	
<p>Educate on environmental issues, developing critical sense. None of the articles had focus on this field explicit; the results show a higher degree of balanced coordination in this dilemma in practice. Across analytic categories, place-responsiveness was seen as an important issue in the educational process.</p>	<p>[43,44,45]</p>
<p>The child as an actor in an empowerment transformer process.</p> <p>Educators are most comfortable with planned activities and have a harder time dealing with new opportunities when it does not correspond to established routines. The children are ready for new activities and adventures. Across analytic categories, place-responsiveness was seen as an important issue in the educational process</p>	<p>[43-45]</p>
<p>Routines and plans are connected to a collective orientation for Scandinavian practice. Children are most ready for new opportunities and adventures. Children and social educators are believed to be resources into potential cultural-social changes in local environments.</p> <p>Across analytic categories, place-responsiveness was seen as an important issue in the educational process</p>	<p>[42,46,]</p>

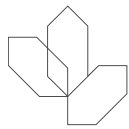


Figure 2 shows how practice changes from Figure 1. From with a wide range of different practices in 2015–2019 to focus on social-cultural transformative processes in Scandinavia. Surprisingly, only five articles were included in this analysis. Though, too much unreflected common-sense and traditional practice activate children outdoor in ECEfSD. There are presented similarities and differences in Scandinavian practice in outdoor kindergarten. The similarities are a practice developing towards a collective orientation with an overall democratic and sociocultural practice and mindset. Overall, similarities and differences can be seen as an intention to practice the national guidelines to deal with the complex problems of the world.

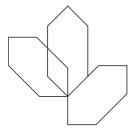
Analysis of Scandinavian literature from 2020–2022 indicates that the practice of purely sensing nature education has lowered, and developed into a higher degree on purposeful educational focus and responsiveness on ECEfSD. The practice shows a higher degree of identity building, that we would call mindset of togetherness in a cultural-social local- and collective-orientated education processes. In 2015-2019 education in the theme, the analysis reveals much unreflected and uncritical taken-for-granted practice in ECEfSD. But also, in 2020–2022 the practice is described as common-sense, traditional, and unreflected ways to activate children outdoor, and social educators are mostly comfortable with routines and planned activities. The development of more purposeful education in a major cultural-social identity is including local communities and extended collaboration [41,44,45,46]. This matches the goals for UNESCO's Learning Objectives in Education for Sustainable Development Goals in key competencies for sustainability, e.g., 'Systems thinking competency: the abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty' [17] (p. 14).

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### **3.1.1. AESTHETIC EDUCATIONAL PROCESSES, 2015–2022**

An aesthetic learning process is a learning method where you transform your impressions of the world into aesthetic form expressions through aesthetic mediation to be able to reflect on and communicate about yourself and the world [47]. Aesthetic educational and learning processes are visual, moving and empirical





processes that appeal to needs related to the age and maturity of children in early childhood kindergarten. Children are active in aesthetic educational processes. Practice on aesthetic educational processes contains a wide variety (drama, drawings, singing, photos, videos, etc.) of ways to discover, play, express and communicate children's feelings, experiences, ideas and educational and learning outcomes. Aesthetic educational processes with knowledge and competences to focus on children in participation and co-determination, is supported by the social educators. So, children are active participants and given opportunities to fulfil their own ideas and ways to express themselves. An aesthetic waste and creative recycling tradition and other aesthetic educational processes exist by several researchers in 2015-2019 [8, 25, 33,34,38]. In later 2020-2022 Scandinavian research, aesthetic educational processes are an important element in cultural-social-orientated educational processes [43,44].

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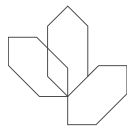
### **3.1.2. MINDFULNESS, BEAUTY OF NATURE AND MENTAL FEELINGS, 2015-2019**

The purpose here is to develop children's relatedness and connectedness to nature and their positive feelings as an identity process towards becoming or being a part of nature. Children's feelings of belonging and well-being, among other terms, are mentioned as an outcome of practice from China [24]. A deeper appreciation of the quality of life in a natural environment in kindergarten is a critical point [29]. Even international frontrunners such as Scandinavian kindergartens have an enormous potential for development [29]. Analysis from Scandinavian articles in 2020-2022 does not mention this field as an important aim. Emotional feelings might be implicit in processes developing cultural-social identity.

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### **3.1.3. ECO-FRIENDLY, E.G., HORTICULTURAL AND AGRICULTURAL EXPERIENCES, 2015-2022**

An eco-friendly emotional practice is traditional and widespread, often with activities such as gardening in nearby cultivated outdoor environments. This can be effortless to incorporate into practice [36]. It was registered in a Danish study that eco-friendly pedagogical activities often manage to motivate children, social educators and parents to rethink and revise to take responsibility and action directed at sustainable



development in the world outside kindergarten [36]. Researchers who deal with practice in this area [25,28,35,36,36,37].

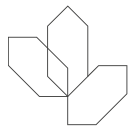
Scandinavian practice in 2020–2022 shows intentions on eco-friendly local communities' activities, e.g., [46,47], including Communities of Place (CoP), on foraging and horticultural activities. This is aligned with Norway's national curriculum, goals and guidelines to collaboration, fundamental religious values, humanist heritage and tradition [48]. There is a focus on 'becoming social and ecological sustainability' [41] (p.1406) and the ability to act [41].

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### **3.1.4. CHILDREN'S PLAY AND CURIOSITY, 2015–2022**

Children's ways and needs to play are a universal cultural tradition with diverse expressions; and play is also regarded to support children's education in sustainable development. There is no 'one way' to playful education and learning. The social educator facilitates children's educational process in a playful way in outdoor kindergarten, which supports the children's curiosity. Broström and Frøkjær (2020) point out a need for further development to identify both problems and potentials on children's play and curiosity on education in sustainable development e. g., on waste and recycling in practice, in dialogue and with commitment in concrete situations in favour of the environment [25]. The strengthened pedagogical curriculum in Denmark frames the content of ECEfSD as follows: *'The pedagogical learning environment should support all children in gaining specific experience with nature that will arouse their curiosity and their desire to explore nature, enable them to experience human connectedness with nature and provide them with an early-stage understanding of the importance of sustainable development'* [49] (p.44).

A wide array of developmental work among social educators is described [25]. Broström and Frøkjær highlight children's play and curiosity from a theoretical and practical point of view. They link furthermore their focus on children's play world, science and sustainability with the vision for a hopeful future. But, also call for further development into a more goal directed education for sustainability [25]. Sustainable development is not a need for only for the kindergarten but a need also for societal action [25]. Data from a three-year study in Canada examine the bodily, social and affective intra-actions of nature and the child with camera technology [34]. The



children, the environment and the GoPro cameras become inseparable and entangled actors in an ongoing process to navigate, understand and experience the field [34], proposing thinking differently about the world and children's relations with the more-than-human world [34]

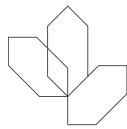
Children's use of imagination is valuable. Caiman and Lundegård [8] describe the process of imagination. The children are playful in developing innovative ideas by using a pram, a tunnel and a trampoline to save frogs [8]. Social educators from Iceland say the children play in the playground every day, using the natural environment and outdoor play as a break to release extra energy [28].

Children's play and curiosity appear more indirectly as a driving force or resource in cultural-social processes in Scandinavian results in the field in 2020–2022 [43,44]. This is in line with nature educational and learning processes and the basis for working with sustainability and the interaction between man, society and nature and involves the children in nature as active cocreators of their own learning [49].

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### **3.1.5. EDUCATION ON ENVIRONMENTAL ISSUES VS PROTECTING THE CHILD'S MIND FROM THE CHALLENGES IN THE REAL WORLD, DEVELOPING CRITICAL SENSE, 2020-2022.**

It is a professional ethical dilemma for social educators in a research from 2015-2019 both to open the wider real-world complexity and problems for the children and to stay in the nearby eco-friendly world in order to protect the children's mind [36], in favour of eco-friendly innovation [25]. Practice has not found a balance between protecting children and involving the real climate problems of the Planet. Social educators in 2015–2019 mostly practise sensory experiences in the outdoors and supply a mindset of protecting the child's mind from the problems in the real world [36]. The Scandinavian articles from 2020 to 2022 do not directly research or focus on this dilemma. Perhaps, the ethic problem described above on open the complexity of the wider world to children's mindset can be intentional in the processes of identity in collective CoP processes or aesthetic educational processes in dialogues on the problems in the real world; these practices are diverse. Article from 2020–2022 have taken position and show practice is taking on the real world's problems in collaborative-orientated ways [46].



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### **3.1.6. THE CHILD AS AN ACTOR IN AN EMPOWERMENT TRANSFORMER PROCESS, 2015-2022**

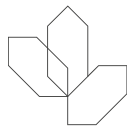
Children's participation and adults taking children's opinions seriously considering sustainable development as a significant matter for children's lives in early childhood education is an argument in Swedish kindergarten. Social educators in Scandinavian kindergartens in 2020-2022 are not completely safe without routines and planned activities and prefer unreflective everyday knowledge as opposed to the children in kindergartens who seem completely ready for new discoveries [41,44].

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### **3.1.7. LEADING RESOURCE IN SUSTAINABLE DEVELOPMENT IS CULTURAL-SOCIAL, 2015-2022**

Culture understood as social mechanisms are considered as outer social input which develops inner cultural social identity. Cultural social processes are regarded as a driver for a more subsistence lifestyle in research from Scandinavian, particular in articles 2020-2022 [45, 46]. The focus in Scandinavian on collective cultural social mechanisms have a broad perspective. The cultural social mechanisms are a resource to drive and develop human collective corporation or cultural production with different actors on locations. The characteristic in this cooperative social situation are humans who invest in and are positive acting on local environments for promoting and changing locations into better places for natural life and another natural phenomenon. Cultural identity and nature understanding are described as a way to promote a global identity and to act locally seen in research from 2015-2019 in villages in rural Alaska [37].

The cultural-social situation around kindergartens are seen as a complex situation. The quality of kindergarten is connected to wider organisation [24]. Social educators point out how they go outside and use the constructed environment in their hometown to learn about history and culture. 'SE (Sustainable Education) involves many things. Culture and . . . connecting with community' [30] (p. 400). The kindergartens often use nearby outdoor areas for sustainable learning opportunities, but EfSD an interwoven situation, and go beyond the outdoor area [46].



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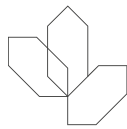
### **3.1.8. PROMOTE A MORAL AND INDIVIDUAL-ORIENTATED RESPONSIBILITY, 2015-2019**

Articles in 2015–2019 focus on promoting children’s individual behaviour. Focus is collaborations with parents on more sustainable behaviour. The research state that individual sustainable consumption behaviours have positive long and short-term impacts on environment, economics, and society’ [39] (p.673). On question 92,9% of the social educators in a research from Turkey answered there is a need for ESD in ECE with focus to promote individual behaviour [31]. The individual focus on ‘childhood experiences in nature allows individuals to demonstrate environmentally friendly behaviour when they getting older’ [31] (p. 6312). Early childhood educators in Queensland and Japan also focus more ‘on individual child development outcomes than on children intentionally learning about environmental/ sustainability concepts’ [40] (p. 10). Educators in a pedagogical course give to children a ‘treasure chest’ that ends up in individual treasure chests; in addition, the children brought the large common treasure chest [25]. (p. 486). This might be an improvisation and an unreflected common-sense practice. The individual-orientated practice is not seen as a result in Scandinavian research in 2020–2022.

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### **3.1.9. ENCOURAGE COLLECTIVE ENVIRONMENTALLY FRIENDLY ACTIONS, 2015-2022**

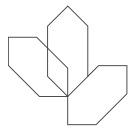
Practice research shows that issues in ecological, social and economic art are seldom linked together [22]. Experiments prove to favour eco-friendly innovations aimed at enhancing children’s eco-friendly behaviour [3]. A Danish article [41] points out a tendency in practice toward dichotomy corresponding to the history of traditional Western science. Culture is the ‘life blood’ [46] (p. 1). Since 2015, five Chinese and two kindergartens in Norway have collaborated on early childhood education with a major focus on promoting education for sustainability A comparative analysis by Hu and Ødemotland [46] focuses on similarities among cultures in involved kindergarten and local communities, and understands culture as a universal social mechanism referring to UNESCO’s understanding of culture as a driver and enabler of sustainable development [17] (p.10-11).



## 4. DISCUSSION

The aim of this paper was to obtain an overview of peer-reviewed articles and gaps in practice in Scandinavia in outdoor kindergarten focusing on education on sustainable development from 2015 to 2022. The starting point for achieving this overview was an international review in 2015–2019, which, among others, show social educators as highly motivated in education in this field. The 2015–2019 research gradually formed a Scandinavian focus, and further research on Scandinavian from the period 2020–2022 followed. The research question and search design and process led to the inclusion of 39 articles with different research methods. Especially in 2015–2019, the articles had a wide range of described practice and perspectives. In addition, authors often contributed and extended their own suggestions for the development of practice in the field. This research shows overall that national curriculums, goals and guidelines in Scandinavia as an important part of the development of a more purposeful education in the field of ECEfSD. A reorientation is proposed with larger degrees of integration between nature and man, and nature and culture, which in the Western part of the world in particular are generally perceived as dichotomic [23,30]. National curriculums recommend to encourage and develop a positive belief in future is aligned with the Swedish National Curriculum [50].

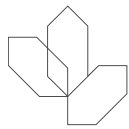
There is a tendency in practice and mindset regarding nature and culture as two different separate phenomenon or as a dichotomy between nature and culture in scientific approach. This is corresponding to the history of traditional Western science [41]. This corresponds with the Danish National Curriculum, which has broad purposes; the guideline on the field of nature and outdoor life is traditional, focusing on education and learning processes in specific combinations of nature, science, and sustainability and not majorly focusing on dimensions of nature-culture processes [49]. The Norwegian government suggests, compared to [48], 'that all children should get insight to foraging as a part of the Norwegian culture and as a contribution to educate for sustainability' [48] (p. 3), with reference to the 2016 Norwegian Ministry of Climate and Environment. Norwegian practice study [45], is building on the existing social-cultural traditions of foraging and horticulture in local areas for kindergarten



as practice on sustainable development. These cultural traditions have so far been used in family life [45].

Other authors [18] points towards how tradition on the duty point out that tradition on the duty of care of the children is perceived as a contradiction to children's democratic rights according to Article 12 of the Convention on the Rights of the Child: respect for children's views [18]. 'Child participation, in the sense that children should have the right to say in matters that affect them and to participates as social agents' [18] (p. 216). This prescribe adults should listen and take children and initiatives seriously with reference to 'Convention on the Rights of the Child' [53].

The social-cultural perspective and collaboration could be supported by more intercultural knowledge and understanding 'global-mindedness' [17] (p. 60). There is variation among the collective and more place-responsive and collective-orientated practice and approach in the three Scandinavian countries. The research results show a social-cultural collective focus that prescribes the inclusion of all children with the possibility of nature experiences, playfulness, aesthetic educational processes and nature and science experiments combined in an integrated approach to the external conditions for developing the field. There is a prescription to stop unreflected customary practice and arguments for the need to rethink philosophy and ethics and practice overall prescriptions on the need for further development [25,36,41,44]. The understanding of sustainable development in daily practice in early childhood education is recommended to encourage the children's own playful experiences and to have more critical reflections by the social educator [25,36,41,44]. Dichotomy thinking is a tradition that is often taken for granted without critical reflection [41]. To solve merged or wicked problems in sustainable development, a critical reflection is to consider scientific traditions that view nature and culture as incomparable and separately examined in a peculiar way. This dichotomy is a dynamic challenge for further merging towards children's holistic education on sustainable development. Interrelated thinking and fusion are recommended as a systemic thinking of practice, because there is a need to change and rethink education for all learners of all ages worldwide in cross-cutting ways compared to UNESCO on the broadly orientated eight Key Competencies for Sustainability as crucial transversal, multifunctional and context independent competencies [17]

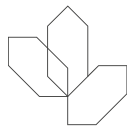


Being supported and given the opportunity for professional development can motivate social educators; in this way, staff can be supported in transforming ideas on ECEfSD into practical activities in a suitable environment [36]. There is no sign in 2020–2022 in Scandinavia that this high motivation among social educators to practise ECEfSD has changed.

In the period 2015–2022, there are growing recommendations to be more sustainably e.g. by using local food and to develop skills and knowledge for new generations. Mutual engagement and participation are seen in Norway for foraging and gardening committed both staff and children to local food heritage and culture for the purpose of a sustainable future and children's agency [46]. Critique led to suggestions upon developing more cultural reflections and collaborations with parents, as well as focus on development of identity by cultural-social processes as a collective posthuman identity [46]. This is implying active engagement of citizens in transforming places aligned with place-responsive education [51]. This might be a hopeful way without 'going naive or romantic' in unreflected practice or place-ambivalent practice. In this mode, the quality of outdoor spaces and places is relevant to discuss and promote kindergartens' nearby outdoor areas for educational and learning opportunities, as well as children's participation. Consideration on sustainability goes beyond the outdoor area [44]. In UNESCO's learning objective, which has goals on developing culture that prevents and prepares SDG, there is less ambivalence; the Key Competencies for Sustainability support the results and perspectives in this review. It is time to develop and implement new skills and knowledge and develop ECEfSD. ECEfSD might, to a higher degree, interweave different elements of cultural-social life, outdoor and indoor education, nature and culture, etc.

This can lead to further development since the social educator, in a dynamically forward-looking way and by having knowledge and skills, takes on the world's real problems, promotes courage and prevents emotional powerlessness [53]. The Anthropocene era and a corresponding dominant anthropocentric view of nature can be seen as a fundamental problem. This overall problem can be reflected in the need for change in kindergarten practice from an approach promoting loving and preserving nature outside to a pedagogical process for children's opportunity to



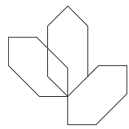


develop a deeper recognition of the attachment to nature [43]. This could be in a holistic place-responsive perspective, to promote habitats for wild nature in sustainable development.

Swedish research shows collective environmentally friendly actions and the child in an active playful empowerment transformative process. In 2020–2022, the Scandinavian research have offers prescriptions on aesthetic processes [43]. Aesthetic learning processes where social educators expand children’s aesthetic productions in collective production as purposeful education on sustainable development, as exemplified by building good habitats for insects in nearby outdoor areas [43].

Nearby outdoor areas must be established with spaces and places in kindergartens for education and learning opportunities, as well as the participation of all children [44]. There is critical commentary on the social educators being most comfortable with planned activities and having a harder time with readiness for new opportunities when they do not correspond to established routines [44]. There are suggestions for more critical reflections in social educators’ practice and, to a greater extent, to grip unplanned or innovative situations where children show initiatives for play, experiments, deepening and expressing their own experiences, feelings, ideas and readiness for action in the field [44], which correspond with the need for strategic competencies, system thinking and collaborative and critical thinking competencies by all learners worldwide [17]. Physical opportunities can nudge or signal EfSD as an element of supporting children and social educators.

The outdoors is often an exceptionally good place to give children expressive sensory input. This is basic for further and more purposeful education. ‘It is about education (not only “learning”)', as Simon Beames formulates it [51] (p. 28). The changes from 2015 to 2022 are comparable to the changes in place-based education, which have developed from unreflected practice/place-ambivalent to place-sensitive to place-essential and to place-responsive as a developmental pattern [51]. This paper show that Scandinavian social educators are initiative-taking for ECEfSD, and they want to develop their knowledge and practical skills; this continues in 2020–2022 in a more social-cultural discourse.



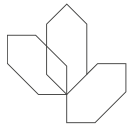
## 5. CONCLUSION

Education for Sustainability development is not fully integrated into Scandinavian outdoor kindergartens. The development in the field from 2015–2019 to 2020–2022 in this paper is characterised by the following.

The practice on sustainable development has moved from being mostly connected to science-related issues to a broader understanding of integrating children's rights to express themselves playfully and imaginatively in complementary nature and cultural-social dimensions, by given possibilities for active participation in collaborative actions in local communities. So, the practice of education for sustainability is less normative with an evolving response to children's ideas, suggestions and perspectives. In the recent articles, the involvement of the children's perspective and the dialogue with them seem to loosen up these issues.

The social educators express in 2015–2019 an indeterminate understanding of key concepts of sustainability and sustainable development and an uncertainty of how to perform practical sustainability-aimed activities in more facilitation-innovative ways or more loosely structured planned processes. In recent articles, Scandinavian social educators are described having a better grip of key issues concerning education for sustainability even if they still express different practices and views. This leads to a discussion on how educational processes in outdoor kindergarten may act in ECEfSD. There is a call for, how children must experience and have the opportunity on their own also for pure unreflected nature experiences and general education and not only participate in strict learning purposefulness; this may be balanced and interwoven in daily practice.

The field is also characterised by issues, such as social educators' implicit understanding of sustainability combined with a low degree of critical reflection on practice. This could be a focused part of education for social educators in the future. There are dilemmas considering the child's perspective and democracy, e.g., working with the individual child perspective as well as with a collective perspective of all children. Social educators are motivated for professional development and in transforming current ideas in this field into practical activities. It calls for professional dialogue, new inspirations and critical reflections on which values, norms and



practical skills should be promoted. It may be a fresh start for outdoor pedagogical kindergartens into more general education on connectedness in nature-social-cultural practice in ECEfSD. This transformation must be supported and formulated appropriately with national and international curriculums, goals and guidelines. There is a need for professional processes to develop further knowledge on concepts, ethics, moral, and philosophy transforming into practical knowledge, skills and methods. It is a major focus to recommend a social-cultural democratised process of place-based responsive education in Scandinavia. Social educators can lead and facilitate processes and mutual exchanges of communication with children, and other co- productive and collaborative partners join in more sustainable purposeful education in kindergartens.

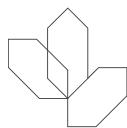


Figure 3. Overview of problem fields in Scandinavian ECEfSD 2022 divided into practice, the social educator and overall.

Practice, the social educator and problems overall	Findings
Practice:	<ul style="list-style-type: none"> <li>• Missing appropriate knowledge and skills and in a wide extent; no supportive or common appropriate frame factors/structural and organisational conditions.</li> </ul>
The social educator:	<ul style="list-style-type: none"> <li>• Willingness and interest in development.</li> <li>• A lack of knowledge, awareness and skills on concepts, ethics, morals and philosophy and on democratic and potentials in facilitative communication.</li> <li>• Including professionals' low degree of reflection on practice and approach to the field.</li> </ul>
Problems overall:	<ul style="list-style-type: none"> <li>• More discussion, dialogue, reflections, awareness and management of professional problems or dilemmas:</li> <li>• Which kind of democratic culture?</li> <li>• Which approach to sustainable development?</li> <li>• Management of professional and other dilemmas.</li> <li>• National curriculum, goals and guidelines transformed into practice.</li> <li>• Reflections on traditional scientific dichotomies, more connection in traditional dichotomies, philosophy of human and nature approach.</li> <li>• Development of staff into sustainable place-responsive education.</li> <li>• Practical examples to be developed.</li> <li>• Dissemination or distribution of new knowledge and skills addressed to social educators.</li> </ul>

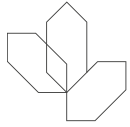
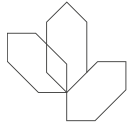


Figure 3 illustrates an overview of the interpretive results for this review. There is a call for ongoing dialogue and critical reflections on what culture is important to develop in the field of ECEfSD. A pattern appears of a pedagogical practice with a potential for further development is not well argued and does not have readiness in daily practice in ECEfSD. There is a need for compliant and adequate knowledge and competencies in this field complex of wicked e.g., in communication and skills with children in the field of collaborative sustainable development. Social educators' practice in ECEfSD in Scandinavia in 2015–2022 shows a widespread understanding of sustainability and sustainable development as a concept and poor background knowledge, insight and competencies. This appears in descriptions of unconsciously, taken-for-granted and unreflected practice in social-cultural activities, combined with a lack of readiness to engage in unplanned situations that the children are invited to. It includes rethinking comprehensive ethics, moral and philosophy and how to practically support the education of children's own opinions in sustainable development. This shows the overall problem as well as the field's paradoxes and dilemmas. The analysis shows a change towards a higher degree of balances and consistencies. ECEfSD in Scandinavia needs a further development of practice to succeed in quality in the field.



**Author Contributions:**

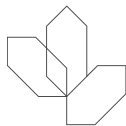
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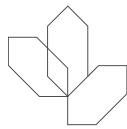



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**APPENDIX. 2.1.1.:**

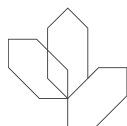
TABLE 2. SEARCH HISTORY FOR DOCUMENTATION OF SEARCHES

Abstract was read on 111 articles (n=111)	Database	n
	Eric	n=61
	Skandinavisk forskning på dagtilbuds-området	n=0
	Forsknings-database.dk	n=21
	Bibliotek.dk - fritekst	n=0
	Idunn	n=1
	FSWE-Pub	n=1
	Oria BIB sys	n=3
	<a href="http://www.diva-portal.org/">http://www.diva-portal.org/</a>	n=1
	Google Scholar advanced	n=23
	Google Scholar	n=0
		n=111

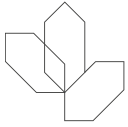


82 Journals excluded after abstract reading	Exclusion: One duplet, other excluded if not including according to PPC	n=82
Full-text reading n=29	No further exclusion	n=0
Thereafter, 10 (n=10) journals were selected from other sources and researchers in the field peer reviewed	<p>Full-text reading other journals:</p> <p><a href="https://emu.dk/sites/default/files/201912/Natur%20udliv%20og%20science%20-%20vidensopsamling.pdf">https://emu.dk/sites/default/files/201912/Natur%20udliv%20og%20science%20-%20vidensopsamling.pdf</a>.</p> <p>ECNU Review of Education 2019, Vol. 2(4) 369–373</p> <p>© The Author(s) 2019</p> <p>Article reuse guidelines: <a href="https://sagepub.com/journals-permissions">sagepub.com/journals-permissions</a></p> <p>DOI: 10.1177/2096531119893478 <a href="https://journals.sagepub.com/home/roe">journals.sagepub.com/home/roe</a></p>	n=10
Five of other sources journals excluded according to PCC	Journals excluded after further quality assessed (PCC)	n=5
Final inclusion	Final journals in the systematic review analyses	n=29 + n=5 = n=34

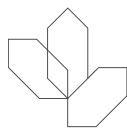




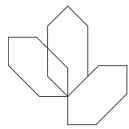
Emneord eller frase	Synonym (er), relaterede emneord, oversættelser af søgeord
Daginstitution	børnehave* udebørnehave* skovbørnehave* dagtilbud*
Pædagog*	
Outdoorpædagogik*	Udepædagogik* dannelse læring
FN's verdensmål for bæredygtig udvikling	Verdensmål*, bæredygtig*



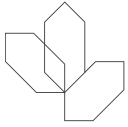
English search -AND /OR				
<i>kindergarten*</i>	<i>or</i>	<i>outdoor*</i>	<i>and</i>	
<i>or</i>	<i>or</i>	<i>'Sustainable Development Goals'</i>		<i>or</i>
<i>preschool*</i>	<i>or</i>	<i>or</i>		<i>or</i>
<i>or</i>	<i>or</i>	<i>SDG</i>		<i>or</i>
<i>daycare</i>	<i>or</i>	<i>or</i>		<i>or</i>
<i>or</i>	<i>or</i>	<i>sustain*</i>		<i>or</i>
<i>prekindergarten**</i>		<i>or</i>		<i>or</i>
<i>or</i>		<i>or</i>		<i>or</i>
<i>'Early childhood education'</i>		<i>or</i>		<i>or</i>
		<i>or</i>		<i>or</i>
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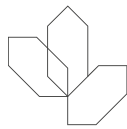
Abstract was read	Database	n	Date March-May 2022
32	Eric d. 24. 2022 marts n=32 - 1 dublets n=31 Peer-reviewed artikler, ekskluderet 25, rest 7, n=7 efter læsning af abstrakt, overført til Zotero all international.  Yderligere eksklusion 8 april afklaring reducering to Scandinavian: Sweden, Norway and Denmark, n=3		24/3
	Eric Jørgensen, Nanna Jordt & Martin ... Denmark - Painting trees  Nordén, Birgitta & A. H. Sweden - redesigning of an outdoor Space  Weldemariam, K. - Sweden - Becoming with Bees  Eric - Green File, n=0	n=3	8/4  27/5
	Idunn  Idunn - Norsk Pedagogisk Tidsskrift	n=0	29/3
	www. DIVA-portal.org/. n=0	n=0	30/3
	SWE-pub. Stopped		
	Oria BIB sys.	n=0	30/3
	Forskningsdatabase.dk. Surpasses UC- viden. Search in	n=0	30/3 27/5



	UC-viden n=1, 1 dublet n=0		
	Skandinavisk forskning på dagtilbudsområdet	n=0	30/3
	Søgning i DPU: Småbørnsliv i dagtilbud: Publikationer af deltagere i forskningsprogrammet,  Forskning i forskningsprogrammet Småbørnsliv i dagtilbud: gennemgang af titler i perioden 2020–2022 medfører 4 inklusioner: n=4 som reduceres til n=0	n=0	30/3
	www. SemanticScholar.org  Date range 2020–2023, Kindergarten AND outdoor AND sustain*  Citation Count reducing n=6420 = n=230 by hand search in Journal of Outdoor and Environmental Education, n=2. Reducing to area education and with citation count, n=1:  Aihua Hu 1,2, * and Siv Ødemotland 3(2021) Fostering Cultural Sustainability in Early Childhood Education through a Neighbourhood Project	n=1	18/3  1/4  27/5 22/6
	SCOPUS: Kindergarten AND Outdoor AND sustain*,		1/4

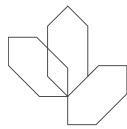


	<p>using analysis of research results, 1) document year, 2) document pr journal, 3) document pr countries or territory, 4) type of document, and 5) documents by subjects.</p> <p>Bergan V.a, Krempig I.W.b, Utsi T.A.c, Bøe K.W.d (2021) I want to participate—communities of practice in foraging and gardening projects as a contribution to social and cultural sustainability in early childhood education.</p>	n=1	
	Status	n=0	22/6
Final inclusion		n=5	22/6 2022

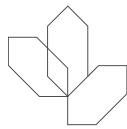


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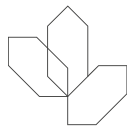


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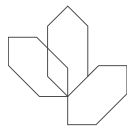


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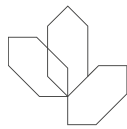




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