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Climate education in early childhood education: Finnish early childhood educators' views

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Abstract

Although climate change is a much-discussed topic, climate education is not mentioned in the Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022). However, it can be connected to the idea of sustainable development and eco-social education. In this article, the state of climate education in Finnish early childhood education is mapped. The dataset consists of an online survey (N=26) addressed to early childhood education personnel interested in environmental education and their thematic interviews (N=7). The dataset was produced in spring 2020. Based on the results, it is suggested that a safe learning environment and the educator's role model are important factors in climate education in the context of early childhood education. First, children need to be provided with a safe learning environment where they can share their concerns and ask questions about the environment and global climate. Second, early childhood educators act as role models for the children and, therefore, it is necessary that educators reflect their values in relation to the environment and climate change.

Keywords: Climate Education, Early Childhood Education, Education for Sustainable Development, Education in Finland, Environmental Education

1. Introduction

Children's and young people's increased concern about climate change mirrors in both their active participation and desire to act for the good of the environment (e.g., Nissen et al., 2021; Trott, 2021) and in their increased environmental anxiety (e.g., Clayton, 2020; Pihkala, 2020). As climate change progresses, the need for developing teaching related to climate change, that is, *climate change education* or *climate education*, has been acknowledged. The need for changing people's values and consumption habits also challenges education sciences.

However, the role of climate education in early childhood education raises questions. The Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National

Agency for Education, 2022) does not mention climate change or climate education. Instead, other themes related to environmental education and sustainable development are clearly highlighted. A sustainable lifestyle is underlined in the general goals and value base of early childhood education, which emphasizes the importance of *eco-social approach to education*. Eco-social education is mentioned in the Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022, p. 11) as follows: "Early childhood education creates a foundation for eco-social education so that people understand that ecological sustainability is a prerequisite for social sustainability and the realization of human rights." Furthermore, in the Finnish National Core Curriculum for Basic Education (Finnish National Agency for Education, 2014, p. 16) eco-social education is distinctly linked to climate change: "Eco-social education means an understanding especially of the seriousness of climate change and an effort to act sustainably".

In addition, goals and proposals for *climate responsibility* have been declared in an action program, *Our planet, our responsibility*, by the Finnish National Agency for Education (2019). In the program, the role of early childhood education is strongly present. Firstly, the program emphasizes the importance of learning climate responsibility from early childhood education to upper secondary education. Secondly, the program aims to ensure that the national goals of learning about climate responsibility is included in the early childhood education curriculum as well as in the curricula of basic and upper secondary education. Thirdly, climate responsibility is defined as one of the basic tasks of kindergartens, schools, and other educational institutions, and therefore it is proposed that climate goals are included in the kindergartens' strategy and action plans. Furthermore, it is encouraged to involve different actors – including children – in the preparation of kindergartens' climate programs.

In this article, we will examine the status, opportunities, and challenges of climate education in the context of Finnish early childhood education. First, we will review how climate education research has progressed over the last decade and present the so-called bicycle model on climate education. Second, we will elaborate on the environmental and climate education studies carried out in early childhood education. The empirical part of our article is based on an online survey (N=26) and thematic interviews (N=7) among early childhood education professionals interested in environmental education. With the help of the dataset, we will examine how the educators perceive the role of climate education in their work. We will ask:

RQ1: What are the special characters of climate education in early childhood education?

RQ2: What are the most important themes, topics, methods, and climate actions to get children to participate in climate education?

RQ3: What barriers to climate education exist in early childhood education?

2. Theoretical background

2.1. Towards the bicycle model on climate education

As people have awakened to the seriousness of climate change, the need for climate education research has been addressed. In their literature review, Monroe et al. (2019) illustrate the change in climate education research as follows: while 13 research articles were published on the subject during the 1990s, in the years 2000-2009 there were already 433 articles published and in the years 2010-2015 as many as 1,489 articles. In their analysis, Monroe et al. (2019) focused on analyzing research articles that evaluated interventions related to climate education and their effectiveness. As a result, they noted that the implementation of climate education involves several challenges. These include, for instance, misconceptions connected to climate change, which have been studied among both students (e.g., Huxster et al., 2015; Liarakou et al., 2011) and student teachers (e.g., Papadimitriou, 2004). Consequently, Ratinen (2016) has emphasized the importance of sufficient skills in natural sciences, in order to understand such a multidimensional phenomenon as climate change.

In Finland, research about climate education has increased rapidly since the 2010s, as well. For instance, the Finnish Climate Change Panel – that promotes the dialogue between science and policymaking – has published two reports on climate education. In the first report, Lehtonen and Cantell (2015) examined the role of climate education and *climate-related competences* in basic education, upper secondary education, vocational schools, and universities. They found that implementing climate education in schools was often the responsibility of individual teachers and their subjects, such as biology and geography. Therefore, Lehtonen and Cantell (2015) emphasized the importance of multidisciplinarity in climate education as well as the role of continuing education in promoting teachers' climate-related competences.

In the second report, Ratinen et al. (2019) explored the views different actors hold on climate education and its goals, especially from the perspective of climate change mitigation and adaptation. They emphasized the importance of maintaining hope, because positive thinking can lead to better results in curbing climate change than in situations involving an atmosphere of hopelessness (see also, Ojala, 2015; Ojala and Bengtsson, 2019; Ratinen and Pahtaja, 2020). In recent years, the role of emotions related to climate change has become a common research topic both internationally (e.g., Kelly, 2017; Ojala, 2015) and in Finland (e.g., Hermans, 2016; Pihkala, 2017, 2020). At the same time, the importance of art-based methodologies in environmental and climate education has been emphasized (e.g., van Boeckel, 2013; Lehtonen, 2021; Suominen, 2016; Ylirisku, 2021).

The need for multidisciplinarity, that is, combining both natural sciences and art-based methodologies in climate education, is stressed in a so-called *bicycle model* on climate education (Figure 1). With the model, Cantell et al. (2019) wanted to emphasize the importance of *systems learning* in promoting climate-related competences. In systems learning, one creates connections between concepts and different phenomena, in order to understand complex entities (Cantell et al., 2019, pp. 719-720). The bicycle model was developed by examining what previous research literature had highlighted as the essential aspects of climate education. In addition, an older climate-education model by Lehtonen and Cantell (2015) was utilized. The model is presented as a bicycle because climate education – like a bicycle – is one entity that requires all its parts to function together (Cantell et al., 2019, p. 718).

According to Cantell et al. (2019), the identity, values, and worldview of a learner create the frame of the bicycle, and the foundation for climate education. Related to the frame, it is essential to ask how each one of us understands the concepts of "sustainability"' and "well-being". That is, what sort of life is considered as good, safe, or happy? Chains and pedals describe action to curb climate change. Children, too, can take part in planning and implementing climate actions together with the adults, which in turn strengthens their motivation and participation. On the other hand, various structural, socio-cultural, and psychological barriers can hamper the action. The wheels depict knowledge and thinking skills, which are necessary for climate education. Although knowledge is essential, gaining more knowledge should not be the aim of climate education. Environmental information should also be analyzed critically and used to gain deeper understanding. In addition, climate change may raise strong emotions, which—in the bicycle model—are depicted as a lamp showing the way forward. Many young people experience strong feelings towards climate change, such as worry, fear, sadness, guilt, hatred, and hopelessness. Even young children can experience environmental anxiety because they cannot avoid hearing about climate change from both the adults and the media. Instead of negativity, climate education should stimulate hope and compassion in people. The handlebar symbolizes envisioning the future. Education should provide ways to look at the future critically, but in a positive light.

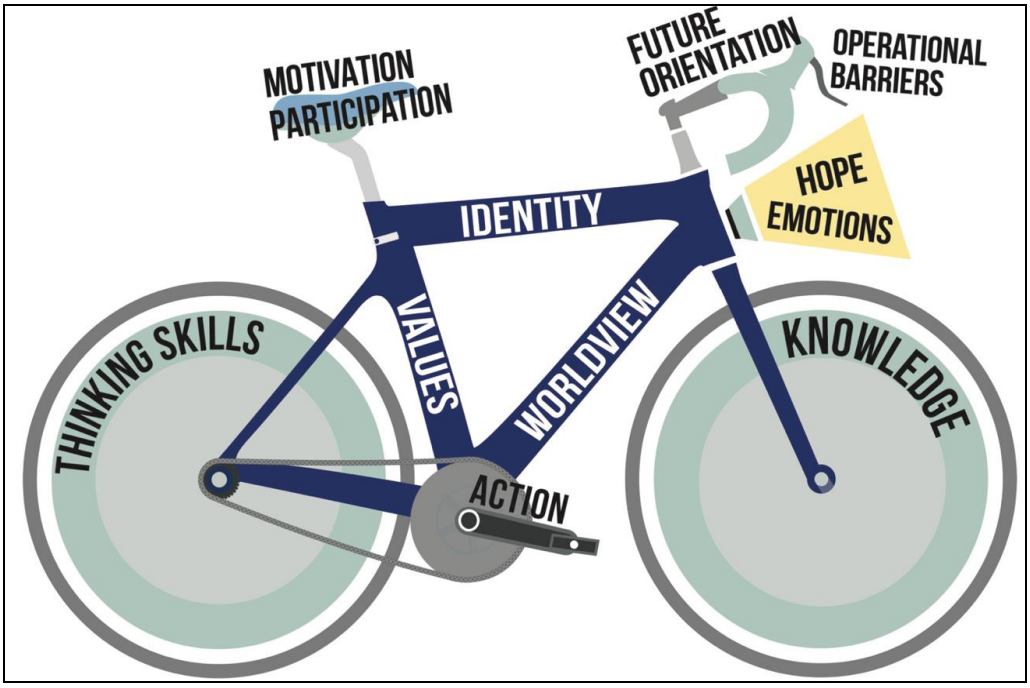

Figure 1. The bicycle model on climate education. Source: Cantell et al., 2019, p. 719.

2.2. Environmental and climate education research in early childhood education

Many environmental education researchers have emphasized the influence of childhood environmental experiences in the development of environmental attitudes (e.g., Chawla, 1998; Stevenson et al., 2014; Tanner, 1980). Some researchers have conducted literature reviews of environmental and sustainability education studies implemented in early childhood education. We have compiled the main information from their reviews in Table 1.

Davis (2009) has examined international and, more specifically, Australian journals on environmental and early childhood education. According to Davis, only little research has been executed on themes related to sustainability in early childhood education. As positive exceptions, Davis mentions Hong Kong, South Korea, and Scandinavian countries, Norway in particular. According to Davis (2009, p. 229), interest in sustainability has also been emerging amongst Australian and New Zealander early childhood educators.

Davis (2009, p. 234) points out how only two research papers on early childhood education were published in the most prestigious international journal for environmental education researchers (i.e., *Environmental Education Research*) during the span of twelve years. According to Davis, one of the main reasons for the lack of research is that, although environmental education activities are included in early childhood education, few early childhood educators conduct research in the field. Consequently, information about environmental and sustainability education projects is not passed on to other representatives of the field, and thus the experiences gained in the projects do not lead to the development of the field by a wider group of researchers (see also, Madden and Liang, 2017).

According to the literature reviews presented in Table 1, researchers have increasingly begun to emphasize the active role of children in the research processes.

Authors and year of publication	Study period	Number of journals	Number of articles	Annotations
Davis 2009	1996–2007	14	39	Some studies explored young children's relationships with nature, a smaller number discussed young children's understandings of environmental topics. Hardly any centered on young children as agents of change.
Hedefalk, Almqvist and Östmän 2015	1996–2013	22	87	The review studied articles related to the subject of education for sustainable development. During the period studied, the research was evolved from teaching children facts about the environment and sustainability issues to educating children to act for change.
Green 2015	2004–2014	9	36	Some studies positioned children as objects of research, but a change towards methods that honor children's perspectives was evident. Although researchers advocated for children's agency, adults were still positioned in the primary role of data collectors, analyzers, and interpreters.
Ardoin and Bowers 2020	1995–2018	27	66	The review studied articles related to teacher-led, formal (school-like) early childhood environmental education programs. The majority emphasized the effectiveness of play-based, nature-rich pedagogical approaches that incorporated movement and social interaction.

Table 1. Literature reviews that analyze environmental and sustainability education in early childhood education.

The emphasis has gradually shifted from adult-led activities towards raising children as active members of the society working for the good of the environment (see, Green, 2015; Hedefalk et al., 2015). Most of the articles analyzed by Ardoin and Bowers (2020) dealt with *environmental literacy* development (also *ecological literacy*, Wong and Kumpulainen, 2021). According to Ardoin and Bowers (2020, p. 9), environmental literacy includes "development of environmental knowledge, understanding, attitudes, skills, and behaviors to inform decision-making processes related to active care-taking of the environment". On the other hand, Álvarez-García et al. (2018) noticed that student teachers lack sufficient *environmental competences* to teach pupils about the environment.

In their literature review, Wolff et al. (2020) define and outline what the mission of early childhood education might be in the epoch of the Anthropocene characterized by global challenges such as climate change. They argue that the Anthropocene demands a new, more authentic education; that is, a change towards a more holistic, transformative, and sustainability-oriented approach. At the same time, they underline that children have a right to a safe, positive, and encouraging childhood.

Ginsburg and Audley (2020) have studied the methods early childhood educators use in their sustainability education in nature-based education centers. According to them, most

teachers promoted activities in the environment, such as children spending time outdoors in the woods, and everyday sustainability practice, but felt they cannot engage in more ethically driven sustainability practices. In addition, climate education was perceived as a challenging topic. The most common reason teachers gave for not talking explicitly about the climate change was that it is labeled as too scary or sad for children to grapple with. In addition, one teacher explained that the idea about "time" in relation to climate change is cognitively too difficult for the children to understand (Ginsburg and Audley, 2020, p. 52).

According to Rooney (2018, p. 5), the challenge for educators in addressing the reality of climate change is the global scale of the problem and the perception that climate change is in many ways an abstract and seemingly distant phenomenon. Rooney examines climate change from the perspective of children's relationship with the weather. Rooney (2018, p. 10) suggest that "by attending to the collective work of weathering in local surrounds, we can open up new possibilities for environmental education that might bring the future, and seemingly distant, challenges of climate change closer to home". In addition, Rooney underlines abandoning of human-centric modes of thinking; that is, there is a need to look beyond learning "about" the weather to more situated and entangled ways of learning "with" the weather. Weldemariam (2020) also goes beyond an anthropocentric understanding of the weather; that is, the weather is an actor together with the children. In addition, Weldemariam stresses the importance of children's *ecological sensitivity* and caring attitude. With both Rooney (2018) and Weldemariam (2020), climate education emerges indirectly through weather-related activities (see also, Rooney et al., 2021).

3. Materials and methods

3.1. Online survey

The dataset was produced in two phases, the first of which was an online survey. It included both structured and open-ended questions (Table 2). We wanted to focus on early childhood education personnel interested in environmental education, because climate education in the context of early childhood education has not established its ground yet and is, therefore, a new branch of education sciences. Thus, the online survey was shared in the following Finnish environmental education Facebook groups: *SYKLI environmental educators* (Syklin ympäristökasvattajat), *Climate educators* (Ilmastokasvattajat), *Environmental and nature education* (Ympäristö- ja luontokasvatus), *Forest groups in early childhood education and teaching* (Metsäryhmät varhaiskasvatuksessa ja opetuksessa), *Outdoor learning* (Ulko-opet), and *Joy grows outdoors* (Ilo kasvaa ulkona). These groups have more than 16,000 members in total. The online survey was shared in *SYKLI environmental educators*' group on April 1, 2020, and to other groups on April 14, 2020. Each group was given two weeks to respond. The online survey was answered by 26 early childhood education professionals. In addition, there was a request in the online survey to leave an email address if the respondent was willing to participate in the thematic interview supplementing the survey.

3.2. Thematic interview

In the second phase of producing the dataset, the respondents of the online survey who signed up as volunteers took part in thematic interviews. Of the 26 early childhood education professionals who responded to the survey, seven participated in the thematic interviews. The interviews were carried out by telephone in May 2020. The themes and questions (Table 3) of the interviews were planned in advance, but the interviews were conversational, and the form, extent, and order of the questions varied between interviews. The length of the interviews varied from 29 minutes to a little over an hour. The interviews were recorded and transcribed.

1. What sorts of thoughts does climate education in early childhood education evoke in you?
2. What sorts of climate-related *themes and topics* do you think would be good to deal with in early childhood education? Choose the most important themes (1–5) in your opinion: • Information about climate change as a phenomenon • Information about the causes of climate change • Information about the effects of climate change • Researching air and weather • Discussing and reflecting on climate issues • Learning climate-friendly lifestyle and values • Activities and citizen participation • Climate actions to mitigate climate change • Climate-friendly consumption in everyday life • Dealing with emotions related to climate change • Monitoring climate-related news • Visioning and discussing the future • Skills for adapting to climate change • Climate education should not be handled in early childhood education
3. Is there anything else you want to share on climate-related themes and topics?
4. If you think climate education should not be handled in early childhood education, please, justify your point of view.
5. What sorts of *methods* do you think are suitable for implementing climate education in early childhood education? Choose the best methods (1–5) in your opinion: • Stories and children's literature • Animations and other means of visual expression • Media and educational videos • Board games and digital educational games • Drama and dancing • Music and singing • Physical play and joint games • Eating situations and health education • Outdoor activities and forest trips • Mathematics and technology education • Science education • Joint discussions and children's meetings • Children's play • Climate education should not be handled in early childhood education
6. Are there any other effective methods for involving and motivating children in climate education?
7. What sorts of climate actions and activities could be implemented in early childhood education?

Table 2. Main questions of the online survey.

1. What sorts of thoughts does climate education evoke in you? • What is meant by climate education in your opinion? • How would you estimate your capabilities to teach climate education? • Do you think it is necessary to talk about climate education or are the concepts of sustainability education and environmental education sufficient? • Do you think it would be necessary to mention climate education or climate change in the Finnish National Core Curriculum for Early Childhood Education and Care?
2. What sorts of *themes and topics* would you emphasize in climate education in early childhood education? • What sorts of climate issues would be good for children to learn in kindergarten? • In which ways do you think climate education for the youngest children and preschoolers differs? • What sorts of climate issues do you think should be handled in basic education instead of early childhood education? • Have you implemented climate education in your work?
3. Is there something in dealing with climate issues in early childhood education that should be avoided or be careful about?
4. In which ways do you think climate-friendly actions could be carried out in early childhood education and the carbon footprint be reduced?
5. What sorts of *methods* could be used to get children involved in dealing with climate issues? • How to make climate education child-oriented? • How to motivate children to participate in climate actions?
6. What sorts of challenges are there for implementing climate education in early childhood education? • Are there any barriers to climate education or climate actions in early childhood education?
7. How should emotions be taken into account when talking about climate change? • How do you think the emotions of children, parents, and personnel affect the implementation of climate education? • Have you encountered worry, anxiety, or sadness related to the environment among children?

Table 3. Main questions of the thematic interview.

In the Results section, the interviewees are referenced according to the interview order (i.e., Interviewee 1-7). The educational backgrounds of the participants varied from university-educated early childhood education teachers to social workers and practical nurses. In addition to early childhood education, many of the participants had studied environmental education. For instance, eight of the participants had completed or were currently completing the environmental educator training program in SYKLI Environmental School of Finland. Four participants had other training in environmental education, such as a bachelor's degree in forestry and natural resources from a University of Applied Sciences.

3.3. Content analysis

The content analysis of the dataset was guided by abductive reasoning where the analysis was influenced by both the dataset and the bicycle model. The bicycle model on climate change education (Cantell et al., 2019) supported the analysis, but the analysis was not directly based on the model. For example, the barriers to climate education mentioned by the respondents are related to the handbrake in the bicycle model. In the analysis, the responses from both the online survey and the thematic interviews were perceived as one piece of dataset, because all the interviewees also filled

out the online survey in advance. This is also reflected in the way the results are reported in this article. The excerpts included here were translated from Finnish to English, and standard punctuation was added for readability (see, Rajala and Akkerman, 2019).

In the Results section, we will describe what sorts of thoughts early childhood education personnel interested in environmental education have about the special characters of climate education, and what climate-related themes, topics, and methods they think are effective when children are included as participants in climate education. We will also describe what sorts of climate actions can be implemented in early childhood education, and what sorts of barriers to climate education the personnel identified.

4. Results

4.1. Special characters of climate education in early childhood education

According to the respondents, early childhood education is meant to increase children's awareness of climate change, and to strengthen their relationships with nature. The educators had heard children talking about environmental issues, for instance, while playing games. Most of the talk related to problems in the everyday environment, such as littering and vandalism. Several interviewees stated how the children had wanted to collect trash from their neighborhood. Positive emotions and the joy of helping had been experienced while cleaning up the environment.

The educators had not witnessed any severe concern or anxiety about the environment, although the littering had made some of the children angry. Extreme weather phenomena – especially the snowless winter in South Finland preceding the interviews – had caused sadness and discussions about climate change amongst children. Families' environmentally friendly consumption choices and environmental information conveyed by the media had also been reflected in the children's talk and games. Interviewee 3 gave the following example:

> *They had an animal hospital and an airport, and one of the children said that they did not want to take part in that airport play because it is not good for the climate.*

Although the respondents expressed their willingness to protect the children from the most distressing information on climate change, they were ready to deal with the children's climate-related emotions. The respondents strongly emphasized the importance of maintaining a safe atmosphere for the children. According to them, children should not be left feeling anxious or hopeless about climate change, neither did they want to leave the children to deal with the climate-related concerns alone. Instead, children should be given opportunities and encouragement to process their climate-related thoughts and emotions together with the adults.

The respondents highlighted the *sense of security and the importance of a safe learning environment* so much that it emerged as one of the special characters of climate education in early childhood education. Because of their young age, children need more security than schoolchildren or young adults. Pihkala (2019) also underlines the importance of maintaining a sense of security in climate education. Children should be able to trust that educators will support them and that even difficult matters can be faced together.

As another special character, the educators highlighted their *position as role models for the children in climate education*. In early childhood education, children work under the guidance of the personnel that models and guides the activities. This can also be reasoned from the larger number of staff in early childhood education compared to basic education. The educators have a significant role in modeling a climate-friendly lifestyle, but they can also unknowingly demonstrate a lifestyle that is harmful to the climate. Therefore, the personnel should be aware of their responsibilities as climate educators and take time to reflect their climate-related attitudes and emotions. Interviewee 1 described the significance of being a role model as follows:

> *First, I would mention the example adults give, that is, in early childhood education, every one of the personnel works as a role*

model for the children, and even the smallest things are mirrored in your behavior.

4.2. The most important themes and topics

According to the respondents, the most important themes and topics (Figure 2) to deal with were *learning a climate-friendly lifestyle* and *consumption in everyday life*. The importance of dealing with *emotions related to climate change* as well as *discussion and reflection on climate issues* were also emphasized. Instead, scientific *information about climate change as a phenomenon* was not perceived as being very important (cf., Ginsburg and Audley, 2020). In the context of scientific information, *researching air and weather* was evaluated as the most important theme. For instance, it is possible to observe what the air smells, looks, or feels like in addition to documenting seasonal changes in weather (see also, Rooney, 2018; Rooney et al., 2021). Indeed, the respondents emphasized that climate-related competencies should be taught through concrete activities and playful methods, which will create a hopeful atmosphere. They felt that it is good for young children's climate education to be practical; in their opinion, scientific information can be learnt in basic education instead of early childhood education. According to Pihkala (2019), an excessive amount of scientific information in climate education should be avoided because it can, in turn, increase environmental anxiety in children and young people. Therefore, it is essential that the knowledge about climate change accumulates gradually.

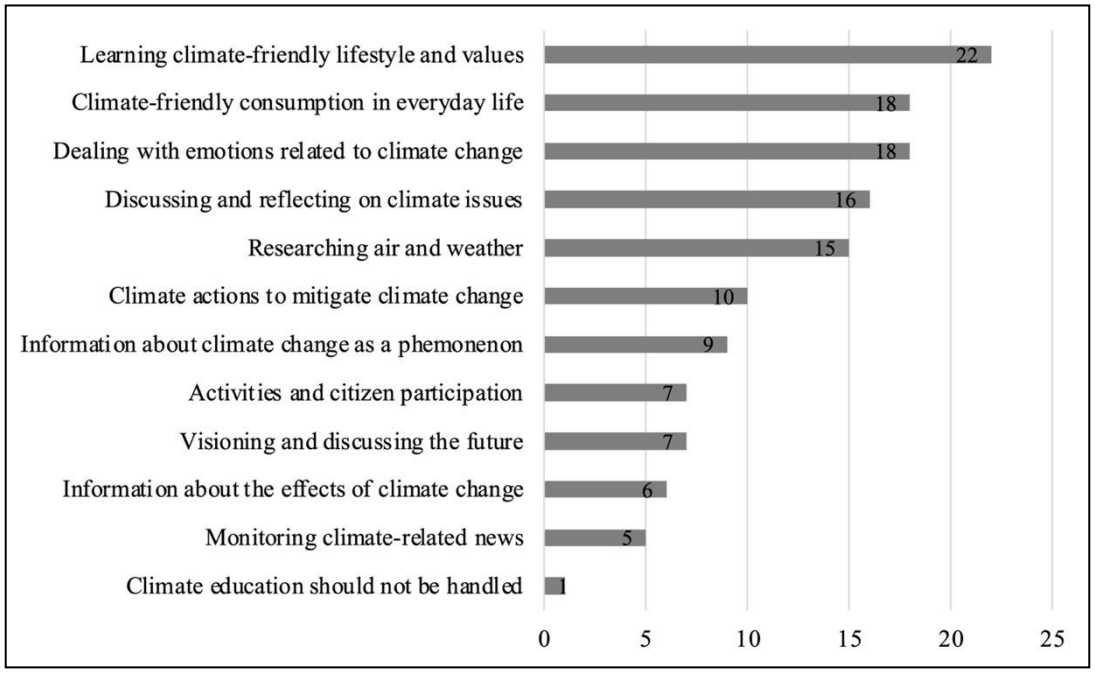

Figure 2. The most important themes and topics of climate education in early childhood education as perceived by the respondents (N=26).

4.3. The best methods and climate actions

We asked about the respondents' views on the most effective methods to involve children in climate education. According to the respondents, children should be included in the planning, implementation, and assessment of climate-related activities from the very beginning. In addition, they emphasized the personnel's sensitivity to respond to children's initiatives; that is, climate education can take place in surprising situations, as well. All in all, it was stressed that all the activities should be child oriented.

In the online survey, the respondents were asked to choose five methods from the options provided (see, Table 2). The best methods of climate education as perceived by the respondents are presented in Figure 3. *Outdoor activities and forest trips* were chosen as the most effective means of implementing climate education in early childhood education. Consequently, during the interviews, natural environments were named as the best learning environments for implementing climate education. The participants described that as children learn to enjoy spending time in natural environments, they will grow up as persons who will cherish environmental values also later in life. According to the Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022, p. 30), "the goal of environmental education is to strengthen children's relationships with nature and responsible behavior in the environment, and to guide them towards a sustainable lifestyle." In addition, *children's play* and *stories and children's literature* were perceived as good methods. They can help in explaining climate-related information to the children and in dealing with emotions related to climate change. Through *joint discussions and children's meetings*, children's climate-related thoughts can be awakened. *Eating situations and health education* were also perceived as good opportunities to implement climate education.

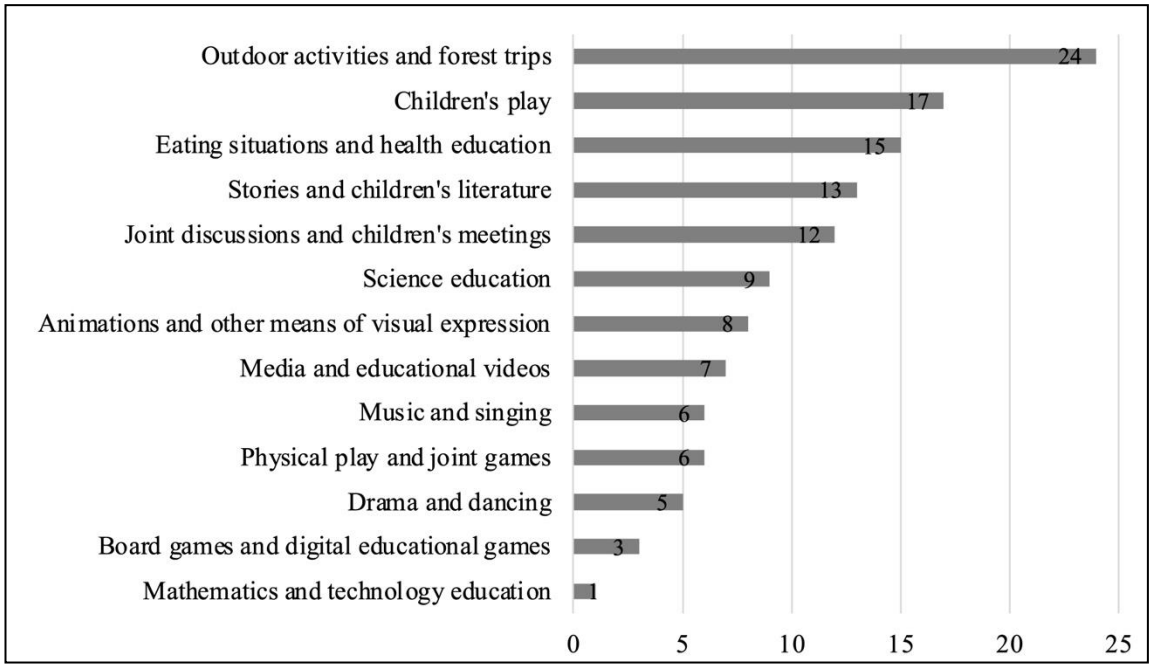

Figure 3. The best methods of climate education in early childhood education as perceived by the respondents (N=26).

In early childhood education, moreover, the personnel and children act as consumers; that is, they make choices that affect the climate on a daily basis. Therefore, we asked about the respondents' views on climate actions that can be implemented in early childhood education. According to the respondents, climate issues should be included in the kindergartens' strategy and action plans. In addition, compliance with an environmental program, such as Eco-Schools, could help in planning kindergartens' climate education. In order to make climate education more effective, instructing parents in environmentally friendly actions and organizing family events were also mentioned.

When it comes to reducing climate emissions in early childhood education, waste sorting and recycling, reducing energy consumption, reducing food waste, favoring climate-friendly food, responsible consumption, and consumer education were mentioned as the most important means. According to Ojala (2019), children should be supported in climate actions both as individual consumers and as active members of the society. The Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022, pp. 20, 30) also provides guidelines for promoting moderate, economical, and responsible consumption in early childhood education. The interviewees underlined that a worldview according to which the most important things in life are not related to consumption should be strengthened. In early childhood education, values and worldviews are largely shaped in everyday consumption choices and in joint discussions with the children.

4.4. Barriers to climate education

According to Lehtonen and Cantell (2015, pp. 15–17), the challenges in climate education are, among others, the complex nature of scientific information concerning climate change, operational cultures of educational institutions, people's behavior and motivation, and the execution of climate education outside the school. All these challenges were also visible in our study. In addition, two types of barriers to climate education in early childhood education appeared: *structural reasons* and *reasons concerning the personnel*.

The most significant *structural reason* was the lack of top-down instructions for the purpose of implementing climate education. The Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022) does not mention climate change or climate education. In addition, the participants expressed the need for guidance and support from employers, supervisors, and municipalities for climate education. None of the respondents had received additional training in climate education from their employer, but the need for it was expressed in the interviews. In their opinion, the educational background of early childhood education teachers does not provide the necessary skills for climate education. Climate education was said to largely depend on individual educators' interest in the topic; that is, climate education is implemented if there is enough enthusiasm, and the work community is sympathetic to it. According to the respondents, the lack of climate education material suitable for early childhood education was also a challenge. There are plenty of learning materials aimed at schools, but they are often not suitable for early childhood education.

Other types of *reasons concerned the personnel* themselves. According to the respondents, the main challenges for climate education was the personnel's lack of knowledge and the fact that some of the personnel do not consider climate education to be an important topic in early childhood education or even suitable for children. In addition to the lack of knowledge about climate change, the respondents expressed their incompetence in teaching climate-related themes and topics in a way suitable for the children. According to the respondents, some professionals feel that climate topics are too distressing, traumatizing, or unsuitable to be dealt with in early childhood education and that is why they keep quiet about climate change. Interviewee 6 described the challenges of climate education as follows:

> *This is a very difficult matter for teachers and educators. Even though I think that these themes should be dealt with in a certain way*

> […] *justifying all the work needed to bring it into everyday life* [is challenging]. *Many people think that you cannot talk about these matters or that they do not belong in the lives of small children at all.*

5. Conclusions

Although climate change speaks to many communities, *climate change* or *climate education* are not mentioned in the Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022). Therefore, early childhood education personnel may be unsure whether the topic should be discussed with children. At the moment, climate education is largely based on learning scientific facts. Instead, children and young people should learn the skills for adopting a climate-friendly lifestyle (Hindley, 2022; Yli-Panula et al., 2022). In the context of early childhood education, it is necessary to think about the small-scale actions that can be carried out by children on a daily basis.

As an example, litter-free camping is mentioned in the Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022, p. 30) as one of the skills for growing into a sustainable lifestyle. Waste sorting and recycling have become established forms of environmental education in both early childhood education and basic education, and sometimes it can seem that recycling has become a universal answer to solving all environmental problems. For this very reason, it is necessary for early childhood education personnel to be able to break down the factors causing climate change and the connections between them. For this to be possible, climate education should be offered to all student teachers. The university role is significant in terms of increasing student teachers' awareness of climate change and a climate-friendly lifestyle. According to Hindley (2022, p. 2), "it is clear that students will need to be more knowledgeable about climate change, as they will have related responsibilities within their future careers".

In Finnish schools, so-called "multidisciplinary learning units" in basic education and "theme studies" in upper secondary education enable the planning and implementation of various climate projects among pupils and students. Because early childhood education is executed holistically and integrated in Finland – that is, there are no independent school subjects nor lessons – early childhood education personnel too have expertise in planning multidisciplinary learning units. This enables the implementation of projects related to climate education in early childhood education, as well. Furthermore, these projects can utilize *guided inquiry learning* as the pedagogical method.

Since *educators act as role models* for children, it is important that they reflect on their behavior and values: What does well-being mean to each educator? What sort of relationship do they have on consumerism? Because the assessment of the quality of early childhood education focuses more on the personnel's actions than children's learning results, reflecting on the educator's role model is particularly important. According to the Finnish National Core Curriculum for Early Childhood Education and Care (Finnish National Agency for Education, 2022, p. 47), the object of the evaluation can, for example, be the interaction of the personnel with the children, the atmosphere of the group, pedagogical methods, the content of activities, and learning environments.

Climate change affects the young generation in particular. For instance, snowless winters in South Finland have made children wonder and ask questions about the environment. In early childhood education, a *safe learning environment*, where climate change can be dealt with together and where children's thoughts and climate-related emotions are accepted, is essential. Consequently, recognizing children's participation in climate education is important. That is, children should have the right to participate in decisions that affect them. Therefore, climate policy should recognize "children and youth as key actors on the climate change agenda rather than as passive observers or victims" (Pegram and Colon, 2019). Indeed, learning and adopting a climate-friendly lifestyle begins already in early childhood.

The empirical dataset presented in this article was one of the first Finnish surveys on climate education in the context of early childhood

education. Although the Facebook groups, in which the online survey was shared, have many members, they were either too busy to answer or perhaps they felt that they do not know enough about climate education as it is a new topic in early childhood education. Since the dataset can be considered relatively small, the results of the study cannot be generalized. Nonetheless, they paint one picture of the Finnish climate education in early childhood education. Consequently, it is important to ask what direction climate education in early childhood education is going, in order to be developed going forward. After all, climate change is a common challenge for humanity, and hope too is generated through collective processes (Nairn, 2019).

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