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Sustainable development perspectives in Nordic physical education curricula: a cross-country comparison of the status and pre-conditions

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ABSTRACT

In the present study, we present a cross-country comparison of the status and condition of sustainable development (SD) in the Nordic physical education (PE) curricula. The aim of the study was to increase knowledge of how SD perspectives are represented and conceptualised in the Nordic PE curricula. An expert-driven research approach was used where representatives from Denmark, Finland, Iceland, Norway, and Sweden provided country overviews and completed surveys to elaborate on the status, pre-conditions, prospect/future, and research initiatives in relation to SD in PE. The study shows that SD perspectives seldom are explicitly mentioned in the Nordic PE curricula, and that little is known regarding how PE teachers understand SD in relation to PE goals and content in their countries. Suggestions on specific SD goals to focus on in Nordic PE, as well as suggestions on future research are provided and discussed in the paper.

KEYWORDS

PE-curriculum; sustainability; sustainable development goals; comparison study; social; pedagogy

Introduction

The relationship between sustainable development (SD) and physical education (PE) has been gaining momentum in research. Since 2021, there has been increased empirical research focusing on qualitative and quantitative studies, particularly among undergraduate students in PE teacher education (PETE) (Baena-Morales & Ferriz-Valero, 2023). Currently, however, little is known about the conceptualisation of SD in PE curricula. In the present study, we add to the literature by presenting a cross-country comparison of the status and pre-conditions of SD in the Nordic PE curricula.

In essence, SD is a broad concept that emphasises the need to meet present societal needs without compromising the ability of future generations to meet their own needs

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(United Nations World Commission on Environment and Development, 1987). SD is an approach that search to balance between economic growth, environmental protection, and social well-being in order to ensure a more sustainable future for all (United Nations, 2015).

The Agenda 2030 is a global initiative, adopted by all United Nations member states, that outlines a shared vision for a sustainable and equitable future for humans and the planet. This approach was formalised in the Agenda 2030 comprising of 17 SD goals (SDGs) and 169 targets addressing a wide range of social, economic, and environmental challenges that the world currently is facing (Figure 1). The Nordic countries have made commendable progress in implementing the SDGs that constitute the agenda, but challenges and gaps remain. These challenges include addressing inequalities, enhancing sustainable consumption and production patterns, and further integrating the economic, social, and environmental dimensions of SD (see e.g. Sachs et al., 2023).

Including SD perspectives in school curricula may be essential since it can provide students with an understanding of global challenges. In addition, including SD perspectives in school curricula may foster awareness of the interrelation between social, economic, and environmental aspects which is described in for example guidelines like *Curriculum Framework for the Sustainable Development Goals* (Osman et al., 2017; see also e.g. Rieckmann et al., 2017). In such a way, schools may support quality education and empower students to develop critical thinking skills and problem-solving abilities to address complex issues, ultimately becoming agents of positive change (Osman et al., 2017; Rieckmann et al., 2017; United Nations, 2015). Moreover, pedagogical perspectives and approaches recommended in the research field of education for SD, often take on a constructivist learning approach and elaborate on onto-epistemological perspectives like transformative pedagogy and student-centered strategies (Boström et al., 2018; Laurie et al., 2016). These pedagogies encourage teaching and learning from a holistic and



Figure 1. The 17 SDGs.

critical perspective where issues of social justice like citizenship and equity can be elaborated. This also links also to questions of health and wellbeing, and can be put in relation to SD and PE. Educative aspects like these are highly relevant for PE-practices to reach broader educational goals as stipulated in the overall curricula where for example norms and values, inclusion and to take responsibility, as well as encounters with nature, are in focus.

To the best of our knowledge, only three studies have explored how SD perspectives are represented in the PE curriculum. In 2019, Hallås et al. conducted an eco-critical text analysis of the Norwegian PE curricula and put a question mark around whether SD was displayed at all.¹ In Australia, Olive and Enright (2021) carried out a search on the Australian Curriculum: Health and Physical Education (AC:HPE) online platform to examine the presence of the Sustainability Cross-Curriculum Priority. The search showed that the term 'sustainability' was identified in two out of 103 content descriptions across Foundation to Year 10. Sustainability appeared in the strand Personal, Social and Community Health, however, it did not appear in the strand Movement and Physical Activity. Overall, the authors found limited inclusion of sustainability issues in the AC: HPE content.

In another study, Fröberg et al. (2022a) explored SD perspectives in the Swedish PE curriculum for compulsory and upper secondary schools. Overall, the results showed that the PE curriculum for compulsory and upper secondary schools lack explicit statements regarding SD. Nevertheless, the commentary materials, which improve the understanding of the texts and their contexts in each curriculum, do include explicit statements about not only outdoor activities and nature, but also ergonomics. Furthermore, potential links were identified between the PE curriculum and the SDGs Good health and wellbeing (#3), Gender equality (#5), Reduced inequalities (#10), Peace, justice, and strong institutions (#16), and Partnerships for the goals (17). It was also argued that there may be a potential link to the SDG Sustainable cities and communities (#11), including self-organised activities and active transportation, such as walking and cycling, that could broaden the conceptualisation of physical activity, improve health, reduce traffic, accidents, fuel use, emissions, and enhance air quality (17).

By having the global initiative of Agenda 2030 and the role of school curricula as a framework, this study will take a closer look upon how SD perspectives are represented and conceptualised in Nordic PE curricula to give a structure and common language.

The present study

The present study presents a cross-country comparison of the status and condition of SD in the Nordic PE curricula. Cross-country comparisons can provide important insights into how different countries address similar issues. In the context of this study, comparing school PE curricula across the Nordic countries may be significant since it explores how these countries integrate sustainable practices into PE. The Nordic countries have in several ways had a common cultural and historical development in terms of a long period of social democracy and the building of a welfare state with free access to schools, higher education and health care. Part of the welfare state has been to let compulsory schools have a compensatory assignment to secure an equivalent education for all students.

The aim of the present study was to increase knowledge of how SD perspectives are represented and conceptualised by experts in the Nordic PE curricula. Following this aim, we addressed two research questions:

- What is the status and pre-condition of SD in the Nordic PE curricula?
- What is the prospect/future and research initiatives in relation to SD in Nordic PE?

By exploring these PE-curricula, educators, and policymakers can learn from each other and ultimately enhance PE and promote sustainable lifestyles, environmental stewardship, and social responsibility.

Methods and material

To address the aim and research questions of the study, an expert-driven four-step research approach was used between Spring and Autumn, 2023. In the first step, experts from the five Nordic countries were recruited through a purposeful sampling

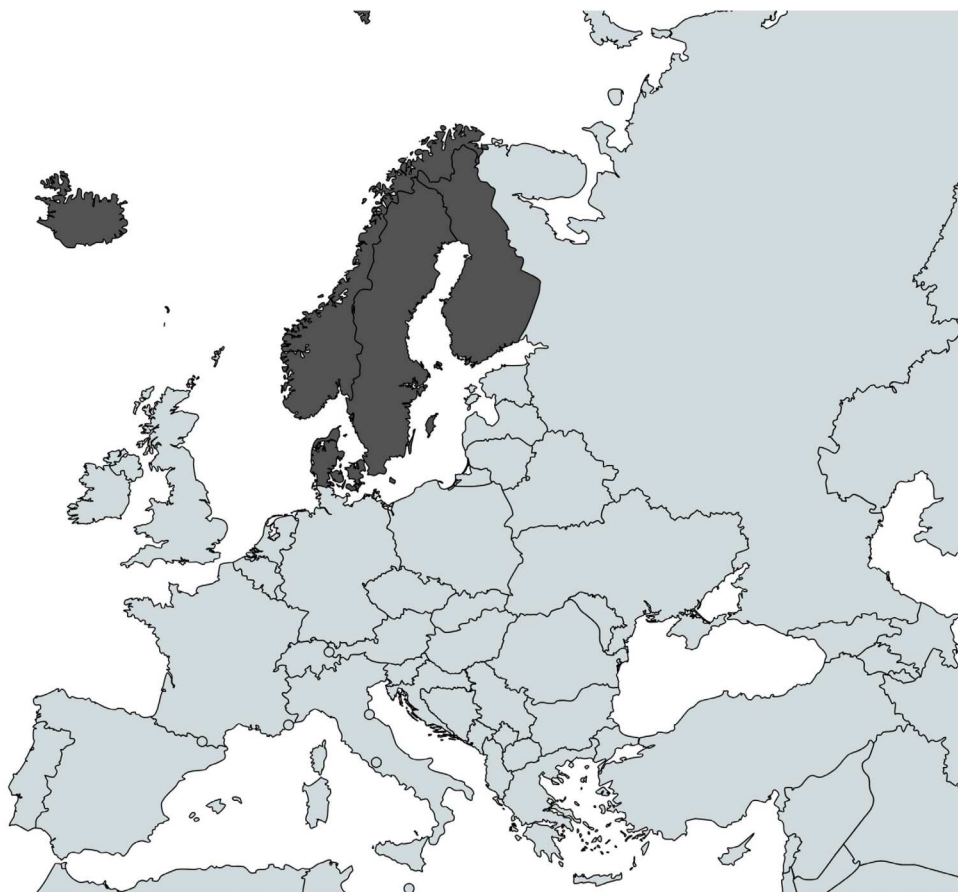


Figure 2. The participating Nordic countries (dark grey) (map created using the open-source MapChart, <https://www.mapchart.net/>).

(Patton, 2015) where all experts were established researchers within teacher education and PE in the Nordic countries (see [Figure 2](#) for a map of the Nordic countries). The two authors (S.L. & A.F.) who initiated the study represented Sweden, used previously established contacts among Nordic PE researchers to recruit experts from Denmark (A. M-S.), Finland (K.S.), Iceland (T.G. & R.S.), and Norway (Å.L.). All contacted experts had experience of curricula research, and agreed to contribute to the study and expressed their commitment to constructive collaboration throughout the research process, except the contacted expert from Iceland who had to withdraw from participating due to a shortage of time. Instead, a recommendation of two other experts from Iceland formed the final sample of experts.

In the second step, the experts provided a document in the form of a written country overview regarding the status and condition of the concept of SD in the overall school policy and curricula, as well as in the specific PE curricula. They also completed a survey to further elaborate on the status and pre-condition, prospect/future, and research initiatives in relation to SD in PE. In the third step, the country overviews were subjected to thematic analysis, and the completed surveys were analysed. Finally, in the fourth step, all experts were invited to an online meeting to discuss, validate the findings, and approve to the final content of the present study.

Country overview

The experts were asked to provide a brief country overview in a text sheet format (about 800–1000 words) that covered both primary (compulsory school) and secondary (upper-secondary) school. They were encouraged to provide examples and make explicit references to the curricula, if available. More specifically, the experts were asked to describe the main objectives of PE in their country, and how SD is addressed in the overall school curricula and in the specific PE curricula. Furthermore, to indicate how SD is interpreted and enacted (i.e. put into practice), as well as if there were any research initiatives with a focus on SD in PE.

Survey

After submitting the country overview, a survey was sent to the experts to further elaborate on the status and condition, prospect/future, and research initiatives in relation to SD in PE. Based on the current PE curricula, the experts indicated which one of the following four alternatives that best described the current situation in their country: (1) SD was not mentioned in the PE curriculum and the current descriptions do not align well with the concept of SE, (2) that SD was not explicitly mentioned in the PE curriculum, however, the existing descriptions (e.g. related concepts) align well with SD, (3) that SD was explicitly mentioned in the PE curriculum, however, that it does not yet adopt a key role, or (4) that SD could be considered a key concept in the PE curriculum. According to the current PE curriculum, its aim, goals, and content, the experts also indicated which of the 17 SDGs could be considered relevant to PE (relevant or not relevant) (see [Figure 1](#)). They were also asked to indicate what parts of PE would SD be particularly well suited, and what changes in PE would be required in order to include SD perspectives to a greater degree. These two questions were answered with an open-text response alternative.

Furthermore, the experts estimated the potential of SD in PE for the future. Using a four-point scale ranging from being quite sceptical to being sure, they indicated the probability that SD could gain increasing importance in PE. Finally, the experts rated the number of research projects dealing with SD in PE in their country by indicating no research project (0), single research projects (1–4), numerous research projects (5–9), or a large number of research projects (≥ 10).

Data extraction and analysis process

One author (A.F.) collected all country overviews and extracted the text to a pre-structured table in a single text sheet to allow for a cross-country comparison. Another author (S.L.) checked the extracted data to verify accuracy. The country overviews were then qualitatively analysed inspired by document analysis (Bowen, 2009) that requires data (text) to 'be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge involved' (Bowen, 2009, p. 27). In this study, the overviews from each expert were seen as the formal document to analyse. Guidelines for document analysis involves an iterative process and the core tenets of thematic analysis where researchers identify and analyse patterns within data (see e.g. Braun & Clarke, 2006). Document analysis has previously been used in sustainability education policy research (see e.g. Aikens et al., 2016). Guided by previous recommendations by Braun and Clarke (2006), two authors (S.L. & A.F.) conducted the first analysis that involved familiarisation with the country overviews, an in-depth reading, and synthesis of patterns, as well as cross-country comparisons. A constructive learning perspective guided the analysis and synthesis of patterns. The draft of the analysis was circulated among all experts to verify accuracy and validate the findings of the present study.

Furthermore, one author (A.F.) extracted the text from the completed surveys to pre-structured tables in a single text sheet to allow for cross-country comparison of the collected data. Another author (S.L.) checked the extracted data to verify accuracy, and the analysis was circulated among all experts to validate the findings.

Findings

Below, we present the findings for the comparative analysis of the country overviews and the surveys.

Country overviews

Main objectives of physical education

The country overviews indicated that Nordic PE curricula emphasises holistic development, promoting physical activity, and health and well-being among students. While there are some variations among the countries, several common features characterise PE in the Nordic context. [Table 1](#) presents the main objective and core content across the Nordic countries.

The objectives of PE across the Nordic countries include developing motor skills, stimulate sport and movement capacity and skills, promoting physical fitness, and cultivating positive attitudes towards healthy lifestyles, including lifelong physical activity. In

Table 1. The main objective and core content across the Nordic countries.

Country	Primary school		Secondary school	
	Main objective	Core content	Main objective	Core content
Denmark a/	To develop physical, social, sportive, and personal competences and to develop joy of movement and a desire for a lifelong physically active lifestyle. To take responsibility for themselves and take part in binding communities.	Three main competence areas: (i) Many-sided PE, (ii) Movement culture and relations and finally (iii) Body, movement, and training. These are again divided into the following binding skills – and knowledge areas which each contain guiding goals for different grades: Ball-basis and ballgames, Basic movements, Dance and expressive activities, Gymnastics, Collaboration and responsibility, Norms and values, Word-knowledge, Body and wellbeing, Physical activity.	To gain good physical capacity, fundamental sporting skills, insight into the body's potential for movement and understanding of the related scientific areas. To motivate for continuing physical activity.	Three main skill-areas: (i) Music and movement, (ii) Ballgames and (iii) Classical and new sports. In addition, the curriculum describes main areas like physical activity and lifestyle, health, cooperation, body-consciousness, principles of exercise, digital tools and knowledge areas like physiology and societal issues concerning sports and exercise.
Finland b/	The task of PE is to influence the pupils' well-being by supporting their physical, social, and psychological functional capacity and a positive body image. PE promotes equity, equality, and togetherness and supports cultural diversity. The pupils are guided in committing to a safe and ethically sustainable activity and learning atmosphere.	Teaching involves a lot of physically active activities. Safe activities are chosen to develop perception and problem-solving skills. Through physical activities, pupils learn to assess and develop their own social skills, respect others and to help and assist others. PE uses activities that teach the children to make a long-term effort, both alone and with others, to achieve a goal.	The task of PE is to influence the pupils' well-being by supporting their physical, social, and psychological functional capacity and a positive body image. PE promotes equity, equality, and togetherness and supports cultural diversity. The pupils are guided in committing to a safe and ethically sustainable activity and learning atmosphere.	Balance, mobility, and equipment handling skills are reinforced through a variety of physical activities. Through physical activities, pupils learn to assess and develop their own social skills, respect others and to help and assist others. PE uses activities that teach the children to make a long-term effort, both alone and with others, to achieve a goal.
Iceland c/	To increase students' physical fitness, motor competence, sports, movement skills and swimming proficiency. Furthermore, to develop knowledge and responsibility among students for a healthy lifestyle, that involves mental,	Learn basic movements, ball skills, develop aerobic and anaerobic stamina, flexibility, and strength exercises. Take part in team sports, individual sports, and fitness programs. Swimming skills in breaststroke, backstroke, crawl,	To increase students' physical fitness, sports and motivate the students to enjoy varied movements by offering different options of physical activity to take part in during PE lessons. The goal is promoting the importance of physical activity for the student's	To learn about the preventive value of physical activity for physical and mental health, stress management and the therapeutic value of exercise against anxiety and depression. The main health factors that are encouraged: Positive self-image, exercise,

(Continued)

Table 1. Continued.

Country	Primary school		Secondary school	
	Main objective	Core content	Main objective	Core content
	physical, and social health.	and butterfly stroke. Learn to take active stance against bullying and violence and to deal with the feelings that result from winning or losing a game.	wellbeing and to create interested in continuing physical activity throughout life.	nutrition, rest, mental wellbeing, positive communication, security, hygiene, sexual health and understanding of one's own feelings and those of others.
Norway d/	To stimulate lifelong joy of movement and a physically active lifestyle based on personal qualities and abilities. To develop competence in exercising, creating with their bodies, lifestyle choices and health. To practice and reflect on collaboration, co-responsibility, understanding and respect for each other, nature and developing environmental awareness.	Bodily movement and coordinative skills in play and other activities, such as swimming, outdoor life, orienteering, dance, team play and sport activities. Exploring and understanding are central aspects of learning activities to develop and challenge bodily abilities, cooperative skills and forming values such as rules, inclusion, and environmental awareness.	To stimulate lifelong joy of movement and a physically active lifestyle based on personal qualities and abilities. To develop competence in exercising, creating with their bodies, lifestyle choices and health. To practice and reflect on collaboration, co-responsibility, understanding, and respect for each other, nature and developing environmental awareness.	The exploratory approach and development of pupil's reflection and understanding are also central content aspects in learning activities in secondary school. The same variety of activities are relevant, but the teaching approach is more reflective and skill exercising. In addition, the water competence includes practicing outdoor lifesaving skills and safety understanding.
Sweden e/	To stimulate pupils' development of all-round movement capacities, interest in being physically active and spending time outdoors in nature. Develop knowledge about what factors affect physical capacity, and how to develop/ take responsibility for a healthy lifestyle. Core areas of content: Movement, Friluftsliv and outdoor visits, Health and lifestyle habits.	Pupils should acquire ability to: move versatily in different physical contexts, carry out and adapt activities within outdoor life, plan and implement activities and how they affect physical ability and health, act safely and prevent risks with movement, friluftsliv, deal with emergencies on land and in water.	To develop students' physical ability and ability to plan, carry out and evaluate various movement activities supporting overall bodily competence, interest in and ability to use various movement activities, outdoor environments, and nature as a source of well-being. Knowledge of norms, stereotypes, health and environmental awareness in working life/ society.	Pupils should acquire ability to plan and carry out physical activities and develop physical ability and health. Implement and adapt outdoor visits to different conditions and environments, handle safety and emergency situations associated with physical activities. Knowledge of cultural, social and ethical aspects in relation to sports and exercise.

Abbreviations: PE, Physical education.

Note: The exact grade levels for primary and secondary school vary across the five Nordic countries.

Sources: Based on the National Curriculum in each country. a/ Denmark: Ministry of Children and Education (2017, 2019), b/ Finland: National Board of Education (2014), c/ Iceland: Ministry of Education, Science and Culture (2013), d/ Norway: Norwegian Directorate for Education and Training, KRO01-05, e/ Sweden: Physical education and health (2022) [course syllabus compulsory school; Physical education and health 1 (2010)].

general, PE takes a comprehensive approach, addressing physical, psychological, and social aspects of well-being. It includes elements of health education and issues related to social development. Furthermore, PE emphasis not only participation and active learning, but also inclusiveness and equitableness, striving to ensure that all students

have equal opportunities to participate and benefit. There are also efforts to accommodate students with various backgrounds and abilities.

Sustainable development in overall school and PE curricula

The country overviews indicated that the Nordic countries have different approaches to incorporating SD perspectives into their education systems. In all countries, the overall school curricula mandate that SD perspectives are a fundamental component of education and should be integrated into all school activities. In this sense, the core section of the school curricula stipulates that SD perspectives should permeate education alongside other basic principles, such as equality, democracy, and human rights.

Although SD perspectives are a fundamental component of education, the country overviews indicated that there are no specific learning objectives explicitly addressed or tied to SD in PE in **Denmark** and **Sweden**. In **Finland**, however, the PE curriculum explicitly addresses SD perspectives as part of the subject, with the objective that ‘students are guided and engaged in safe and ethical sustainable behaviour and learning atmosphere’ (National Board of Education, 2014, p. 158). The **Norwegian** overall curriculum (implemented in 2020) describes values which form the basis for the school’s mandate to form and educate independent, inclusive, and environmentally conscious citizens in a complex modern world with an uncertain future (Ministry of Education and Research, 2017, p. 4). Human dignity, critical thinking and ethical awareness, democracy and participation, and respect for nature and environmental awareness are examples of values expressed in this document. The **Norwegian** overall curriculum also describes three interdisciplinary themes that have been developed and concretised as part of the school’s principle for learning, development, and education: ‘Public health and life skills’, ‘Democracy and citizenship’ and ‘Sustainable development’. These interdisciplinary themes are to be incorporated as thematic directions into all parts of the curriculum, including the curriculum for PE. This means that the learning content described in the PE curriculum is rooted in the values and attitudes based on societal challenges emphasised in the overall curriculum. An example can be understood from this statement in the PE curriculum ‘the subject shall contribute to understanding that the choices each person makes have an impact on and consequences for sustainable development and the protection of life on Earth, locally, regionally and globally’ (The Norwegian Directorate for Education and Training, 2020, About the Subject). Moreover, the PE curriculum in **Iceland** state that ‘teaching [PE] provides a good opportunity to connect health education and sustainability in lifestyles’ (Ministry of Education, Science and Culture (2013, p. 188)).

Despite the lack of explicit objectives, experts from all the countries indicated that PE centres on areas relevant to SD perspectives in different ways, however, mostly in relation to the SDG Good health and well-being (#3). The PE curriculum in **Denmark** centres on health, although mostly in relation to individual health and healthy lifestyle (Ministry of Children and, 2019, 2017). In **Iceland**, many schools have projects that link PE to health promotion and sustainability, equipping students with essential competencies for adopting healthy lifestyles and understanding sustainability. Moreover, one focus in **Norwegian** PE is on social development that may be relevant to SD, formulated in a competence aim for the 10th grade in secondary school; ‘recognise differences between

oneself and others in movement activities and include everyone, regardless background and abilities' (Norwegian Directorate for Education and Training, 2020). In **Norway**, there is also an emphasis on creating situations for bodily learning and experiences, as well as the opportunity for students to become better acquainted with themselves, their own identities, and their bodies, which would promote independent thinking about life choices, their health, and the quality of life for both them and others. In addition, core elements, such as outdoor and nature-based activities emphasise nature experiences and encourages reflection on sustainable recreation in nature.

In **Sweden**, like the other countries, students should develop the ability to move without restriction across contexts, and plan, implement and evaluate activities. PE should also stimulate students to develop an understanding of the value of an active outdoor life and close by settings (Physical Education and Health, 2022). These areas align with SD perspectives, including the SDG of Good health and well-being (#3). Moreover, students' ability to show respect for others, including creating awareness and to challenge conventional perceptions of norms, and the impacts of body ideals should be developed. This ethical and moral dimension should be addressed in sports practice. These areas may relate specifically to SDGs, such as Gender equality (#5) and Reducing inequality (#10).

Sustainable development – interpreted and enacted

The experts indicated that little is known regarding how SD perspectives are interpreted and enacted in education, and how PE teachers understand these in relation to goals and content in their countries, as well as what students learn. For example, the expert from **Denmark** noted that some schools, on a local level, have made it mandatory for teachers to implement the 17 SDGs in teaching in general, and that explicit or implicit learning processes may take place in relation to dimensions of SD. In **Finland**, the expert described that the interpretation and enactment of SD perspectives highly depends on the teacher, and that some may choose to exclude these perspectives since there are no clear SD learning objectives. There is, a similar situation in **Norway**, **Iceland**, and **Sweden** with a limited understanding of how sustainability can be effectively taught, and little is known about how SD perspectives are integrated into PE.

Moreover, there were initiatives to support education about SD perspectives across various educational levels. In **Denmark**, an example of a political interpretation of the 2030 agenda is an electronic platform hosted by the Ministry of Children and Education that provides general knowledge about the SDGs as well as links with suggestions, information, and recommendations for teaching sustainability across various educational levels (www.emu.dk). This platform links among other things to the teaching material *Sustainable development goals in movement* from the Danish School Sport Association which covers 30 modules that interpret the SDGs to the students through movement. It also links to a digital learning site suggesting learning processes in different subjects in upper secondary school, however so far only one learning activity suggested for PE (www.verdensmaalene.dk). Furthermore, the experts from **Iceland** indicated that there is a considerable emphasis on the eco-school movement in compulsory schools, with a focus on nature preservation and recycling. Physical health-inspired projects that also highlight environmental sustainability are implemented, such as the walk to school

project that promote sustainable, active transportation. Many schools in **Iceland** also conduct outdoor education, and PE lessons are often implemented outdoor, providing opportunities for creative play and interaction with nature. In this sense, SD perspectives may be integrated with PE through various indoor and outdoor physical activities and sports. The experts from **Sweden** highlighted findings from a survey among Swedish PE teachers suggesting that a smaller group of teachers perceived that they already did teach SD perspectives in various ways, but they did not relate the learning activities to aspects of sustainable development. Themes of activities and projects related to SD, as described by these PE teachers, included exploring the local environment, outdoor life (friluftsliv) and care of nature, interdisciplinary projects, picking waste and recycling, and focus on issues, such as sustainable bodies, sustainable lifestyles, health, and well-being, and sustainable use of products and consumption (Fröberg et al., 2022b). Accordingly, local instances seem to exist that illustrate the implementation of the policy.

Findings from the survey

Table 2 present the responses regarding the status and condition, prospect/future, and research initiatives across the Nordic countries. The experts from **Denmark, Finland, Iceland,** and **Sweden** indicated that SD was not explicitly mentioned in the PE curriculum, although the existing descriptions were considered to align well with SD. In **Norway** SD could be considered as a key concept in the PE curriculum.

Moreover, Figure 3 shows in which countries the SDGs were indicated as relevant based on the current PE curriculum, its aims, objectives, and content. The number of

Table 2. Statements and responses regarding the status and condition, prospect/future, and research initiatives in relation to SD in PE across the five Nordic countries.

Item	Country				
	Denmark	Finland	Iceland	Norway	Sweden
Based on the current PE curriculum, indicate the status on the concept of SD (status and condition)	SD is not explicitly mentioned in the curriculum, however the existing descriptions (e.g. related concepts) align well with SD	SD is not explicitly mentioned in the curriculum, however the existing descriptions (e.g. related concepts) align well with SD	SD is not explicitly mentioned in the curriculum, however the existing descriptions (e.g. related concepts) align well with SD	SD can be considered a key concept in the curriculum	SD is not explicitly mentioned in the curriculum, however the existing descriptions (e.g. related concepts) align well with SD
Estimate the potential of SD in PE for the future (prospect/future)	Probable that SD can gain some further importance in PE in the near future	Convinced that SD will gain increasing importance in PE in the near future	Probable that SD can gain some further importance in PE in the near future	Convinced that SD will gain increasing importance in PE in the near future	Convinced that SD will gain increasing importance in PE in the near future
Rate the number of research projects dealing with SD in PE in your country (research initiatives)	No research project or just a single effort that has not yet gained much attention	No research project or just a single effort that has not yet gained much attention	No research project or just a single effort that has not yet gained much attention	Only single research projects (1-4) that are dealing or have dealt with SD in PE	Only single research projects (1-4) that are dealing or have dealt with SD in PE

Abbreviations: PE, Physical education; SD, Sustainable development.

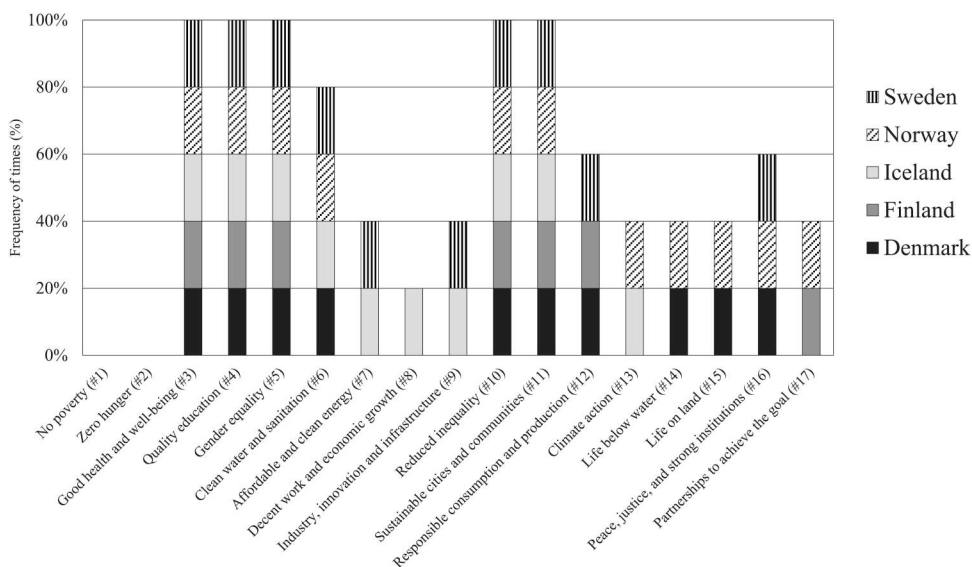


Figure 3. Stacked bar chart showing in which countries the SDGs were indicated as relevant based on the current PE curriculum, its aims, objectives and content.

SDGs that were indicated as relevant for PE was seven in **Finland**, nine in **Denmark and Iceland**, ten in **Sweden**, and eleven in **Norway**. The SDGs that were indicated as relevant in all five countries were Good health and well-being (#3), Quality education (#4), Gender equality (#5), Reducing inequality (#10), and Sustainable cities and communities (#11) (Figure 3).

In relation to what parts of PE would SD be particularly well suited (open response text alternative), there were several opinions, such as perspectives and awareness related to health and well-being (**Denmark, Norway & Sweden**), outdoor education (**Finland, Iceland & Sweden**), everyday physical activity (**Sweden**), and sustainable transportation (**Iceland**), as well as all-round movement competence and exercise (**Sweden**), and how to perform sport in a sustainable way (**Denmark**). Experts from **Sweden** also noted that different games and dance, which integrate aspects of interplay, inclusion, and integration, are well suited for elaborating on the social dimension of SD.

The answers to what changes in PE that would be required to include perspectives on SD to a greater degree (open response text alternative), included reforming the PE curriculum (**Denmark**) or the overall idea of PE (**Finland**). Similarly, experts from **Sweden** noted a need for a re-orientation in relation to health education, moving beyond the focus on individual health to also include the health of others, including aspects of the health of the planet. Moreover, attention should be directed towards peri-urban friluftsliv, including teaching about how green environments affect health and our possibilities of being physically active in close by areas. In addition, experts from **Denmark** and **Finland** noted commuting perspectives (active transportation), and a critical approach towards exercise and sport from the perspective of SD. As presented in Table 2, the experts considered it as probable or were convinced that SD would gain increasing importance in PE in the near future.

In terms of research, experts from **Denmark, Finland, and Iceland** indicated that there were no research initiatives or just single efforts that has not yet gained much attention, whereas experts from **Norway and Sweden** indicated that there were single research initiatives that are dealing or have dealt with the exploring of SD-perspectives in PE (Table 2). The expert from **Norway** stated that the current curriculum is relatively new, which may also be an explanation of the lack of research studies with an outspoken SD focus. In **Sweden**, there are two ongoing research initiatives related to the conceptualisation of SD in PE. One of the research initiatives pay specific attention to outdoor life and friluftsliv, as well as sustainable use of products (Mistra Sport & Outdoors, conducted at Malmö University and Dalarna University). The other initiative explores how perspectives of SD can be framed and integrated within PE, using a variety of research designs and methods, including an action research project with in-service PE teachers (POSSIBILITY, and acronym for Physical educatiOn, health and SuStainABIL-ITY, conducted at Gothenburg University).

In summary the findings indicate that there are both similarities and differences between the five countries. Though no country has clear learning objectives related to perspectives of SD in the PE curricula. Norway with a strong cultural tradition towards the outdoors has the strongest formulations related to SD.

Discussion

The aim of the present study was to increase knowledge of how SD perspectives are represented and conceptualised in the Nordic PE curricula. The overall findings indicate that, although the overall school curricula mandate that SD perspectives are a fundamental component of education across all countries, there are few or no specific objectives explicitly tied to SD perspectives in PE. Little is also known regarding how SD is conceptualised, interpreted and enacted in education, and how PE teachers understand SD in relation to PE goals and content in their countries. These findings are in line with research from Australia where Olive and Enright (2021) found limited inclusion of sustainability in the AC: HPE content. Despite this, however, the Nordic countries seem to share a common understanding of the role of PE in promoting physical activity, movement competence, health and well-being, and sustainable behaviours and attitudes among students. The experts recognise the potential and possibility of integrating SD perspectives into the Nordic PE curricula for example by focusing on outdoor education, active transportation, and health and well-being.

Previously, some suggestions have been made to enhance the discussions and actions regarding SD perspectives in PE, including revising curricula, changing learning approaches of how to empower students to become change agents through learning activities and critical reflections in PE, as well as re-evaluating perspectives towards health and well-being (Lundvall & Fröberg, 2023). Given the broad spectrum of issues covered by the 2030 agenda, it may seem unrealistic that PE can contribute to and work on all 17 SDGs. By not delimiting to a smaller number of SDGs may risk a lack of focus, where the message about the concrete contribution of PE to SD perspectives can become less prominent or even lost. As shown in the present study, there are varying perspectives on the relevance of the SDGs in PE, and this is similar to previous research (see e.g. an overview in Baena-Morales & Ferriz-

Valero, 2023). The experts in the current study therefore recommend that Nordic PE may benefit from concentrating on a sample of SDGs. Five SDGs were chosen as relevant in all the countries: Good health and well-being (#3), Quality education (#4), Gender equality (#5), Reducing inequality (#10), and Sustainable cities and communities (#11). Focusing on these goals can be rewarding and create a common starting point during continued work, both from a curriculum perspective and further empirical research. By paying attention to the social dimension of SD there are reasons to explore how the broader concept of global health sits beside a focus on individual health and physical activity, to elaborate on caring, action and responsibility urging for new and other pedagogical approaches. Another example is to move towards more student-centred teaching with assignments that promote and challenge students' thinking, doing and acting from a localised and bottom-up process: which SDGs will be relevant to our school, to PE, to whom, where, when and why? (Taylor et al., 2016; see also Olive & Enright, 2021; Öhman & Sund, 2021). Furthermore, it is possible to pay attention to how to support sustainable choices, as well as how movement, sport and PA require physical and green spaces that is accessible for all, safe, and enjoyable (Kelso et al., 2021). As shown in this study, little is known regarding how SD is interpreted and enacted in education, and how PE teachers understand SD in relation to PE goals and content in their countries. To date, there are few empirical studies in the field of SD and PE (Baena-Morales & Ferriz-Valero, 2023). Future studies could also benefit from further examining the alignment of curricula and SD, a complex and multifaceted concept. At the same time, the experts anticipate that SD will gain increasing importance in PE in the future, but that there are few SD research efforts in Nordic PE. In terms of future research, the next step advocated is to move from theory to practice exploring how in-service PE teachers interpret and enact SD perspectives as part of their teaching. Future studies should also pay attention to the Nordic PETE programs and how SD can be included as part of policies and practice (Fröberg & Lundvall, 2022). For example, PETE educators should consider the conceptualisation and integrating of SD perspectives into course syllabi to foster critical reflection in relation to potentially transforming teaching and learning in PETE.

This study has both strengths and limitations. One strength is the efforts to include multiple perspectives from different countries using an expert-driven four-step research approach. However, all country overviews and surveys were mostly completed by single actors, with a maximum of two experts per country involved. Therefore, the documentation of the situation regarding the SD perspectives in the PE curricula highly relies on the expertise, experiences, and viewpoints of these experts. While subjective perceptions may be crucial for exploring how SD perspectives are reflected in the PE curricula, the collected data have been substantially influenced by the personal perspectives of the experts. Furthermore, the Nordic PE curricula were partly analysed against the background of the 2030 agenda and the 17 SDGs decided in 2015. The analysis carried out have been affected by the year the latest PE curriculum revision was conducted: Iceland in 2013, Finland in 2014, Denmark in 2017 for compulsory school and 2019 for upper secondary school, Norway in 2020, and Sweden in 2022 for compulsory school and 2011 for upper secondary school. These limitations should be taken into account when interpreting the findings of the present study.

Conclusion

The present study shows that SD perspectives seldom are explicitly mentioned in the Nordic PE curricula, and that little is known regarding how PE teachers understand SD in relation to PE goals and content in their countries. However, there is a potential and possibility of integrating SD perspectives into the PE curricula and focus on the five SDGs Good health and well-being (#3), Quality education (#4), Gender equality (#5), Reduced inequalities (#10), and Sustainable cities and communities (#11). Furthermore, there is a need of moving from theory to practice exploring how in-service PE teachers and PETE educators interpret and enact SD perspectives and policies as part of their teaching practices.

Note

1. A new school reform was implemented in 2020 (KR001-05) where the concept sustainable transportation in nature was included.

Disclosure statement

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

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