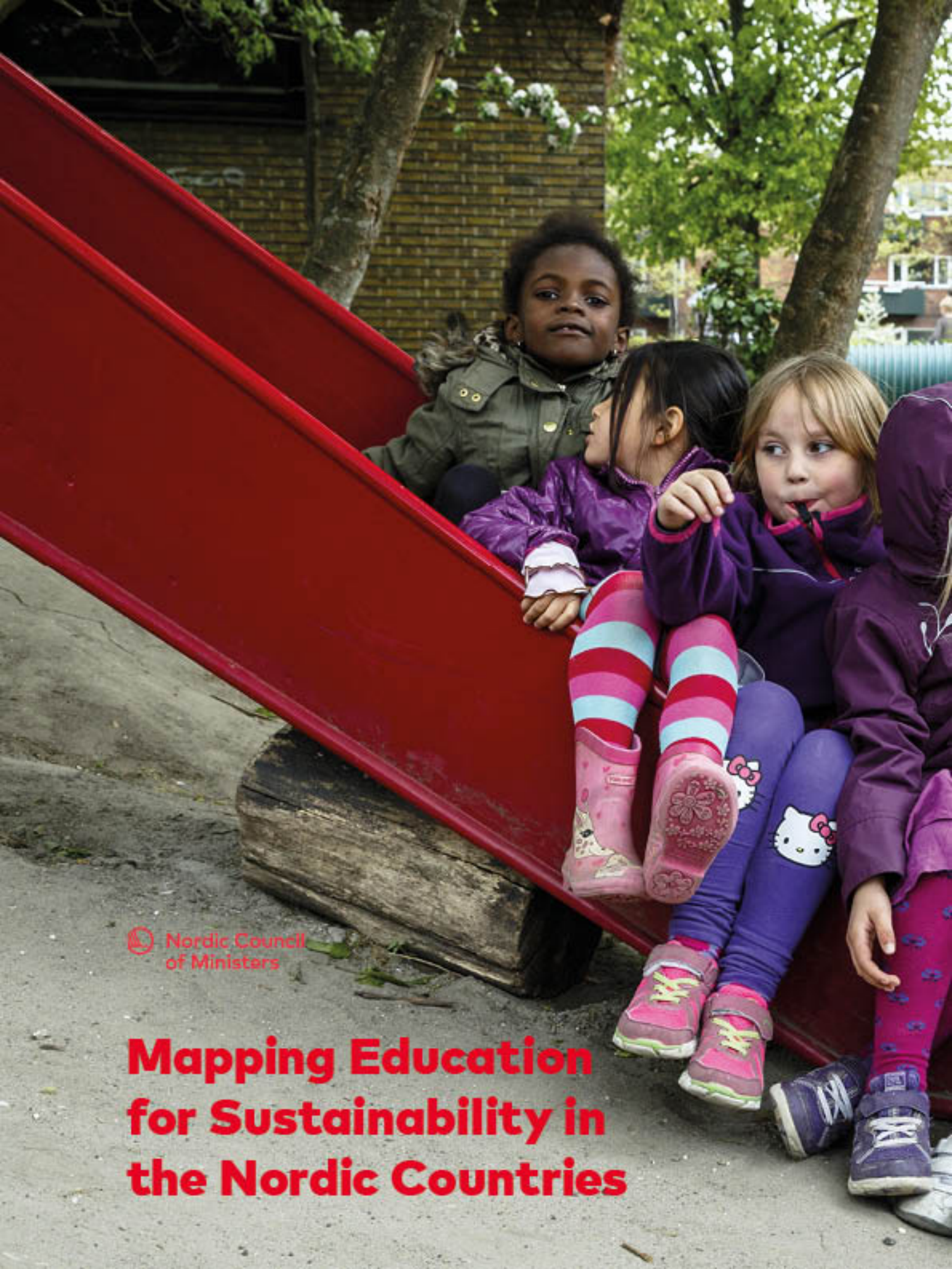




 Nordic Council
of Ministers

Mapping Education for Sustainability in the Nordic Countries

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1. Introduction

This report presents some of the main results of research conducted on Education for Sustainable Development (ESD) in the Nordic countries – one of Iceland's presidency projects for the Nordic Council of Ministers initiated in 2019 under the heading *A Common Path* (Nordic Council of Ministers, 2018). Iceland's presidency focused on the UN Sustainable Development Goals (UNSDGs) with special attention to young people. This was emphasised by the Prime Minister of Iceland and the Minister for Nordic Cooperation who introduced the projects.

The Icelandic Presidency will focus on issues concerning young people in the Nordic region – the generation born around the turn of the century beginning to make its way in life. We want to listen to young people and support projects that promote education, culture and health. (Nordic Council of Ministers, 2018, p. 5)

The project presented in this report concerns the implementation of UN Sustainable Development Goal 4.7 in compulsory education in Denmark, Finland, Iceland, Norway, and Sweden. The aim was both to receive an overview of how well each of the Nordic countries had integrated the UNSDGs into their educational policies and practices. There are seventeen UNSDGs; Goal 4 concerns education specifically. The sub-goal on which we focused our research was UNSDG 4.7 which states:

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

As one can immediately see, the goal is broad and, therefore, a thorough mapping of its implementation was outside of the present project's scope. However, we attempt to outline a picture of how things stand in the Nordic countries, looking at legislation, curriculum, teacher education, and local implementation with the aim of identifying a "Nordic Perspective". We try to bring out not only how things stand in each country, but also to shed light on what is common and where things differ. The more we have worked on this, the more we are painfully aware of how our work does little more than scratch the surface. But in order to go deeper, one has to begin by scratching the surface. We hope that what we present here goes a little further than the bare surface and, more importantly, will help others to continue to dig deeper.

1.1 Initiation of the project

Initial planning in Iceland began in May 2018. A year later, in April 2019, the concept for the project had been developed further and the Ministry of Education, Science and Culture appointed Ólafur Páll Jónsson at the University of Iceland, School of Education, as the leader of the work (letter dated April 26th). In this letter, the main task is described in the following way:

To work constructively towards the implementation of SDG4.7, it is important to gather information on the situation in all the Nordic Countries w.r.t. those factors covered by the goal. With that in mind, mapping of how the implementation of UNSDG 4.7 and all its subordinate factors is going in all the Nordic countries. The work is divided into two parts. Part (1) consists in analyses of policy documents, existing research and other available data, while Part (2) consists of data gathering. This work will be carried out in collaboration with universities in the Nordic Countries.

The two parts of the project were then divided into sub-projects in the following way:

Part 1:

- Collect from laws, regulations, national curricula, and the curricula of teacher education institutions discussion about the elements of UNSDG 4.7. Are these factors mentioned and, if so, how?
Deliverable: A unified presentation of the content of above-mentioned documents.
- Analyse research and surveys, Nordic and international, which concern these factors. What do they tell us about the implementation of UNSDG 4.7? Do they provide any measures that can be utilized in the future?
Deliverable: An overview of research on educational practice concerning UNSDG 4.7 w.r.t. the Nordic countries.
- What information is available in surveys and external evaluation reports on pre-, primary, and secondary education? What other documents are available that might provide additional information?
Deliverable: A report on what surveys and external reports say about UNSDG 4.7.
- Review measures and indicators used to evaluate the success of the implementation of items that fall under UNSDG 4.7.
Deliverables: Unified measures and indicators for the Nordic countries to evaluate UNSDG 4.7.

Part 2:

- Teacher education: How are UNSDG 4.7 factors addressed in teacher education in the different Nordic countries? Data will be gathered by reading curricula and course descriptions together with focus groups with university teachers. (Part of this could already be available in existing research.)
Deliverable: A common overview of emphasis in teacher education pertaining to UNSDG 4.7.
- Elementary schools: What do principals and teachers say about the implementation of UNSDG 4.7? How has the implementation been carried out? In what subjects? Is there any organized work on school culture? Are there focus groups with principals and teachers?
Deliverable: An overview implementation approaches and how principals and teachers view the issue.
- Elementary schools: What support do the schools need to work more constructively with UNSDG 4.7?
Deliverable: An overview of the kind of support for which there is most demand.
- Elementary schools: Find examples of good practices and describe them.
Deliverable: Descriptions of a few examples of what has been done well (one or two from each country).

The plan was to form project teams in each Nordic country comprised of a researcher and a graduate student or postdoctoral fellow. The group of project teams was formed by late May 2019 and held its first online meeting on June 19th. It was clear that the group would have to adjust the goals of the project to find a balance between what would be most relevant given the overall task and what would be possible to achieve within the limits of the project.

2. Defining sustainability education

In the UNSDG 4.7, six different elements are mentioned as falling under the general aim of acquiring knowledge and skills needed for sustainable development:

- human rights
- gender equality
- sustainable lifestyles
- appreciation of cultural diversity
- promotion of a culture of peace and non-violence
- appreciation of culture's contribution to sustainable development

These elements indicate a wide understanding of education for sustainability but leave open to what exactly such education amounts. Should it, for instance, be more like what Stephen Sterling refers to as "sustainable education" or the less radical "education for sustainable development"? Sterling describes the difference between the two concepts in the following way:

The term 'sustainable education' implies whole paradigm change, one which asserts both humanistic and ecological values. By contrast, any 'education for something', however worthy, such as for 'the environment' or 'citizenship', tends to become both accommodated and marginalized by the mainstream. So while 'education for sustainable development' has in recent years won a small niche, the overall educational paradigm otherwise remains unchanged. (Sterling, 2001, p. 14)

Sterling then goes on to discuss the detrimental effects of traditional educational paradigm:

Within this paradigm, most mainstream education *sustains unsustainability* – through uncritically reproducing norms, by fragmenting understanding, by sieving winners and losers, by recognizing only narrow parts of the spectrum of human ability and need, by an inability to explore alternatives, by rewarding dependency and conformity, and by servicing the consumerist machine. (Sterling, 2001, pp. 14–15)

Continuing along this path, Sterling distinguishes change and learning at three different orders. The distinction is important in the context of sustainability education when the educational systems being considered have, as Sterling claims, promoted values that undermine sustainable living.

First order change and learning take place within accepted boundaries; it is adaptive learning that leaves basic values unexamined and unchanged.... By contrast, second order change and learning involve critically reflective learning, when we examine the assumptions that influence first-order learning.... At a deeper level still, when third order learning happens, we are able to see things differently. It is creative and involves a deep awareness of alternative worldviews and ways of doing things. It is, as Einstein suggests, a shift of consciousness, and it is this transformative level of learning, both at individual and whole society levels, that radical movement towards sustainability requires. (Sterling, 2001, p. 15)

To capture the difference between these three orders of learning in three words, so to speak, one might say that first order learning values *compliance*; students are expected to comply with the values, practices, and evaluations of relevant knowledge already present. Second order learning values *criticality*; students are encouraged to be critical of the first order learning that takes place within the system. Meanwhile, third order learning not only values criticality but encourages *radicality*; students are encouraged and given space to not only be critical of the values and practices within the system but also to challenge those values and practices, pushing for new possibilities even against entrenched norms. Sterling maintains that the times are such that compliance will only continue to make things worse, while criticality may expose the faults in the system but falls short of initiating real change. The only educational paradigm that meets the demands of the times – i.e. can help us move away from our grossly unsustainable ways towards sustainable living – is the one which, in addition to criticality, also fosters radicality.

When examining educational law, national curricula, and other important policy documents on education, it is important to notice, first, whether these documents aim for a change and, second, at what order or level such change is supposed to occur. Do policymakers aim at improvements within the present educational paradigm – perhaps expanding somewhat the knowledge base and paying more attention to different fields of study, perhaps also encouraging some interdisciplinary cooperation – or do they aim at more profound change that might involve a rethinking of the very paradigm of education on which the educational systems are based? In order to evaluate the educational policy for sustainability in the Nordic countries from this perspective, we consider policy applied to learning at three different levels or within three different domains: (1) cognitive domain (knowledge and understanding), (2) domain of intention and action, and (3) affective domain (see e.g. Sterling, 2014). These three domains are often represented as three intersecting circles (see fig. 1).

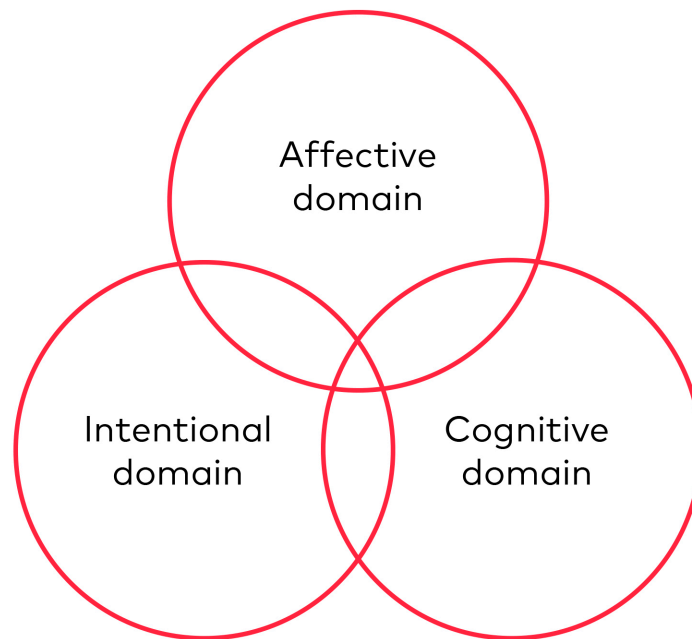


Figure 1: *Three domains of learning. (Sterling 2014)*

In the traditional educational paradigm, the cognitive domain is central and occupies most space, whether from the perspective of learning material (e.g. textbooks), teaching methods (lecturing or other means of knowledge transmission), or evaluation (final exams, standardised tests). The intentional domain is also quite visible, for instance in demands for more democratic education and participative pedagogy. Focus on such elements is, however, often sidelined by an overarching emphasis on the cognitive domain in educational evaluation. Thus, a curriculum may talk about the importance of democracy and participation in an introductory chapter, even highlighting such aspects as active citizenship among the main objective of the educational system, but forget these fundamentals and focus almost exclusively on cognitive elements in relation to the evaluation of learning within the system. (van Poeck, Lysgaard, and Reid, 2018; Gough and Scott, 2001; Jónsson, 2011; Jónsson, 2018)

Educational policy which is serious about third order learning and change (in the above sense) would not leave behind the cognitive and intentional domains but expand the policy to include also the affective domain. But the issue is not only what is present within the system – for a radical educational system will certainly include elements from the cognitive and intentional domains – but also how the different elements are valued within the system. In particular, when aiming for a radical educational change, a system cannot prioritise conventional knowledge within the cognitive domain at the expense of the other two domains. Moreover, a balance between the three aspects is not just a matter of asserting an appropriate amount, so to speak, but also of assigning an appropriate interplay between them; knowledge acquisition should not be separated from work focusing on intentions and emotions, but rather integral to both of them. Likewise, emotions should be

grounded in both knowledge and a sense of action competence.

In line with the above view, an educational policy that aims for third order educational change in Sterling's sense will not be represented by three intersecting circles but by three nested circles as shown in the picture below.

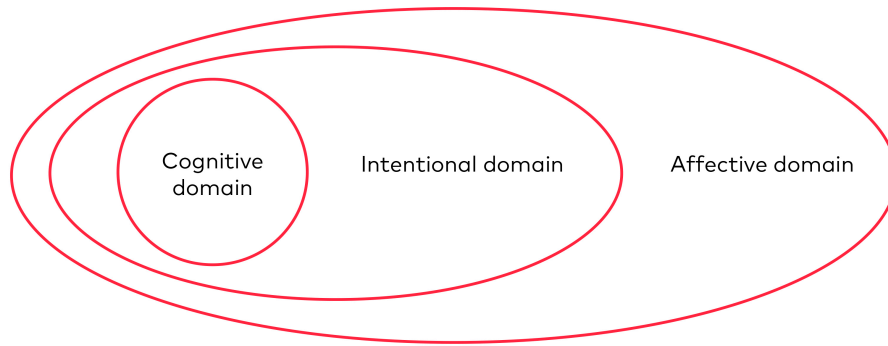


Figure 2: *Educational policy concerned with all three domains of learning – cognitive, intentional, and affective.*

When searching for emphases on sustainability in educational policy documents, we will, in line with the above understanding, pay special attention to how the things we find reflect the three domains.

3. Educational policy for sustainability in the Nordic countries

Approaches to sustainability education differ among the Nordic countries (Andersen et al., 2015; Cars and West, 2014; Jóhannesson, Norðdahl, Óskarsdóttir, Pálsdóttir, and Pétursdóttir, 2011; Rolls, Madsen, Rough, and Larsen, 2015; Åhlberg, Aineslahti, Alppi, Houtsonen, Nuutinen, and Salonen, 2015), but how deep these differences run is not immediately evident. A brief review of the main trends reveals striking similarities – long histories of environmental emphasis in education, emphasis on democratic education, and focus on equality – but, at the same time, these elements have entered the educational systems in very different ways, are interpreted differently, and are often set against very different social background conditions.

In this section, we analyse current educational policies and research to draw out aspects relating to sustainability education in each country. The aim is twofold. First, we aim to offer a clear picture of educational policy pertaining to sustainability education (or its variants) and how each country is doing w.r.t. UNSDG 4.7. Second, we provide an overview of the Nordic countries as a whole and see whether a common Nordic approach to sustainability education can be detected. More specifically, we aim to answer the following questions:

1. How is sustainability education (or its variants) construed in educational policy in each of the Nordic countries?
2. Is there a common understanding of sustainability as an aim in education and as an approach in schools throughout the Nordic countries?

We focus on primary and lower secondary education levels (6/7 years to 15/16 years) as these levels are both more extensive than the preschool level or the upper secondary level, and lend themselves better to inter-Nordic comparison than the levels above or below do. The documents we analyse differ from one country to another. In some countries, such as Iceland, the relevant documents are rather few: law on compulsory education, national curricula guides, and a white paper on educational reform. The situation is very different in Sweden where, in addition to the educational act and the national curricula guides, regulations coming from the National Agency for Education (Skolverket) must be considered, as well as an action plan co-developed by the Ministry of Finance and the Ministry Foreign Affairs and more. To complicate things further, the scope of sustainability education is both wide and fuzzy, concerning both content and methods, which varies from one country to another.

3.1 Documents for analysis

In selecting documents for analysis, we focus mainly on the top level in the educational system, i.e. laws, national or regional curricula, and other policy documents which are national or regional in scope. In this report, we do not examine at the educational policy of individual municipalities or schools. In the tables below, we list the kinds of documents we have analysed for each country.

Table 1: Policy documents analysed

Country	Educational act	National curricula	White papers, etc.	Other documents
Denmark	Law of Primary Education: Chapter one, Purpose of Primary Education (<i>Folkeskoleloven</i>) (2006)	Common goals (<i>Fælles mål: Vejledende – en del af eksamenspensum</i>) (2017)*		UNESCO: UNSDG Schools (<i>Verdensmålsskoler</i>) International Project (2019) Vocational Schools (<i>Erhvervsskoler</i>) (2019)
Finland	Basic Education Act, Grades 1–9 (ages 7–16) (1998) Government Decrees on the national goals of education and distribution of lesson hours in basic education (1435/2001)	The National Core Curriculum for Basic Education (2016)	A national strategy for environmental education (1991) Strategy for education and training for sustainable development and implementation plan 2006–2014 (Finnish National Commission on Sustainable Development, Sub-committee for Education, 2006) Governmental regulation, No. 1435 (included as attachment in core curriculum, 2004) <i>Kansallisten kestävä kehitystä edistävien kasvatuksen ja koulutuksen strategioiden toimeenpanon arviointi</i> (Gaia Consulting, 2012, evaluation) <i>Ympäristökasvatuksen ja ympäristötietoisuuden kehittäminen</i> (Ministry of Environment, 2015, report)	Sustainable development in education: Implementation of Baltic 21E-programme and Finnish strategy for the Decade of Education for Sustainable Development 2005–2014 (2016) Education for global responsibility – Finnish perspectives (2007) Global Education 2010 (2007) Sustainable development in schools and educational institutions (National Board of Education / Rajakorpi and Rajakorpi, 2001, evaluation) Education for sustainable development in Finland (Ministry of Education / Loukola, Isoaho, Lindström, 2001, report) Several global education documents Several strategies of Ministry of Education (later Ministry of Education and Culture)

* As the name indicates, this is a law and could, therefore, be listed in the first column. However, since the content of the law is comparable to the national curricula in other Nordic countries, it is placed in the second column of the table.

Country	Educational act	National curricula	White papers, etc.	Other documents
Iceland	Law on compulsory education (ages 6–16) (<i>Lög um grunnskóla</i> , No. 91/2008) (2008)	The Icelandic national curriculum guide for compulsory schools: General section (<i>Aðalnámskrá grunnskóla: Almennur hluti</i>) (2011) The Icelandic national curriculum guide for compulsory schools: With subject areas (<i>Aðalnámskrá grunnskóla: Greinasvið</i>) (2013)	White paper on educational reform (<i>Hvítbók um umbætur í menntun</i>) (2014)	
Norway	Educational Act (Opplæringslova) (1998)	National curriculum for knowledge promotion in primary and secondary ed. and training (2006) Core curriculum (overordnet del – verdier og prinsipper for grunn-opplæringen) (2017) LK20, Norwegian national curriculum (2020)	Knowledge for a common future (Kunnskap for en felles fremtid) (2012) NOU 2015: 8, School of the Future St. meld 28 (2015–2016): Subjects – Specialisation – Understanding 2015 – 2016 (<i>Fag – Fordypning – Forståelse: En fornyelse av Kunnskapsløftet</i>) NOU 2020: 2, Competence requirements for the future (<i>Fremtidige kompetansebehov</i>)	
Sweden	Education Act (2010)	Curriculum for compulsory school, preschool class, and school-age educare (2011/rev. 2019)	Award for a School for Sustainable Development (Skolverket) (2018) Action Plan Agenda 2030 (Ministry of Finance, Ministry of Foreign Affairs) (2018) Learning for sustainable development in steering documents for preschool and school (Swedish Council for Higher Ed.) (2017)	The National Agency for Education's regulations on the Award for a School for Sustainable Development (2019) - Promote and prevent so we reach the environmental goals – in-depth evaluation (<i>Naturvårdsverket</i>) (2015)

From a short glance at the above tables (1 to 5), it is evident that educational policy is designed and implemented in different ways in the Nordic countries. It is also noticeable that the current laws date to quite different times, from 1998 in Norway and Finland to 2010 in Sweden. More striking differences appear, however, once we begin to analyse the content of the documents. Positive and negative similarities also appear.

In the educational acts in the Nordic countries, the word "sustainability" is not mentioned once in the actual law (listed in Column 1 of Tables 1–5). However, the laws address issues such as democracy, human rights, equality, and respect for nature which are elements of sustainability education. On the other hand, sustainability is often mentioned explicitly and even dealt with at length on the level of national curricula, special reports, or strategy papers from the Ministries of Education. Thus, in the Icelandic national curriculum from 2011, sustainable development is defined as one of the six pillars of education that should be reflected in all education. Likewise, in a white paper from the Norwegian Ministry of Education and in the renewed curriculum from 2020 (Læreplan, 2020), sustainable development is mentioned as one of three interdisciplinary and overarching themes that should be implemented in all subjects and act as a link between subjects. In the Finnish national core curriculum for basic education, sustainability is one of the core values (mentioned almost 200 times).

4. Sustainability in educational policy

When searching for emphases on sustainability education in the policy documents, we search for a wide array of elements since sustainability involves diverse factors – some coming from traditional environmental education, others from human rights and citizenship education, and still others related to literacy, action competence, and values or character education. From this brief overview of elements relevant for sustainability, it is clear that almost anything one encounters in a curriculum may be interpreted as promoting sustainability – potentially, at least. It is, therefore, important to read the policy documents with some scrutiny. Is the emphasis on, say, literacy simply an emphasis on individual students learning to master the technique of reading, or is it an emphasis on students developing competence in critical reading and the evaluation of information? The latter is certainly an important element in developing competences that are central for leading a sustainable lifestyle, while the former has no special connection to sustainability (although a first step in the direction of developing various literacy competences). In the following subsections, we will describe how sustainability appears in the policy documents from each country – or how it fails to be mentioned.

4.1 Sustainability in Danish educational policy

Explicit emphasis on sustainability in Danish educational policy is sparse. The term pops up in the curriculum framework but is not an integral point of the overall policies regarding the Danish school system. There are, however, close ties to core issues relating to sustainability evident throughout several layers of the Danish policy outlines. One example in the Danish law regulating the public-school level (grades 1–10) includes perspectives on relationships between individuals, society, and nature:

§1. In collaboration with the parents, the public school shall provide pupils with knowledge and skills that: prepare them for further education and ensure their interest in learning, familiarize the pupils with Danish culture and history, give them an understanding of other countries and cultures, contribute to their understanding of human interaction with nature, and promote the individual pupil's versatile development. (UVM, 2020)

This paragraph represents the foundation from which most other initiatives and curriculum depart. One could argue that sustainability is present implicitly in this paragraph and that there are parallels to UNSDG 4.7. There is equally emphasis on the importance of acknowledging both history and culture present in a Danish context, and it is also necessary to achieve understanding of other cultures in broader contexts than solely within the country. Furthermore, there is specific emphasis on the role of human interactions with nature. In Danish, "samspil" can indicate an holistic, circular relationship with nature as well as the knowledge, skills, and familiarity with nature having positive effects on the versatile development of each pupil.

The emphasis on "understanding" is very much present not only in the law but throughout Danish curriculum. This refers to a diffuse set of values, norms, and ideas that together can be understood with connection to the tradition of *Bildung*, which feeds more or less into all levels of the subjects taught in the Danish elementary school (*folkeskole*). An effect of this is that the focus on sustainability is not only implicit, but also a theme where each school and teacher may interpret their own understandings of sustainability. This also affects the current integration and implementation of sustainability education perspectives into Danish curriculum, which leads us to conclude that the implementation of UNSDG 4.7 has not happened by 2020 to any great extent. However, we would like to highlight some examples where sustainability is mentioned explicitly in Danish curriculum.

Curriculum framework

The current Danish curriculum (*Fælles mål*) mentions 'sustainability' twenty-two times and 'sustainable development' seven times. There are, however, no specific definitions for how the concept of sustainability is framed, and the following examples show the term is being used in different ways with a variety of meanings. The following examples illustrate how the concept of sustainability is used throughout the specific curriculum designed for each subject (*fagmål*).

In relation to the subject Food Literacy (*madkundskab*), the pupil is expected to "[b]e able to make critically reflected food choices based on knowledge of food, season, origin, health value, production methods, and sustainability" (UVM, 2018). Here, sustainability acts as a quality indicator supporting rational choices in relation to food, underlining the severe complexity and challenges that often imbue such choices. It is further stressed that the student must "learn to take part in and co-responsibility for issues related to food, food choices, cooking, and meals related to culture, well-being, health, and sustainability." (UVM, 2018). Here, sustainability is put together with a wide range of challenges that need to be addressed throughout the teaching. These challenges are not specifically defined or explained, but add to the overall impression that sustainability is a relatively open concept, framed as an important and inclusive challenge, that must be incorporated into the teaching in order to qualify the perceptions, understandings, and actions of the individual pupil.

In the specific curriculum for the subject Craft and Design (*håndværk og design*), sustainability is also mentioned:

Through craft and design, students must gain an understanding of material culture in students' everyday lives and in different cultures and time periods. Students must acquire an understanding of resources, environment, and sustainable development in relation to the use of materials. (UVM, 2018)

Here, we see a representation of a broader version of sustainability through use of the term 'sustainable development'. In a Danish context, this phrase is used in countless different ways. We see the framing of the concept linked directly to environmental and resource issues, broadening the understanding and potential impact of the concept. The concept is not neutral, but implies a certain, relatively strong understanding of e.g. scarcity of resources. This contrasts with the more holistic understanding of sustainability presented in the previous examples.

Another subject that also includes sustainable development is Nature and Technology (*natur og teknik*) which mentions the concept in Part 13:

The pupils must develop an understanding of the interaction between man and nature in their own and foreign communities as well as accountability to the environment as a background for commitment and action in relation to sustainable development. (UVM 2018)

In this example, sustainability is related to accountability, environment, commitment, and action, which shapes a broader narrative where one could argue that there is a more elaborate focus on the necessity of sustainable doings. This emphasis, mirroring uses of the concept in e.g. Geography, Biology, and Physics/Chemistry, exposes a more normative take on the concept of sustainability than when it is presented as an explicit goal of certain educational activities. This differs from the use of 'sustainability' or 'sustainable development' in e.g. Food Literacy as the concept here not only qualifies the individual choices of each pupil, but also acts as an external imperative that needs to be addressed throughout the teaching.

Overall, it must be concluded that there are few mentions of sustainability in the Danish curricular framework. The uses of the concept are, however, interestingly different, sometimes indicative of relatively strong normative understanding. They do not, however, represent a more coordinated or structured approach. The concept is neither defined nor used in a coherent manner, but supports already existing (and different) agendas within specific subject curricula.

The above examples show that the Danish government's strategy is mostly based on specific targets designed for each subject. One could argue that these targets are very isolated – and that there is still great work to be done before we can begin to grasp a national implementation of UNSDG 4.7. So far, the Ministry of Children and Education has not addressed an official national approach concerning education for sustainability development to ensure the implementation at the primary or lower secondary levels. In contrast to the official policy, many private organisations support passionate teachers and principals who are experimenting with incorporating sustainability in different ways.

4.2 Sustainability in Finnish educational policy

Sustainability has been an important and recurring element in Finnish public policy and law since the 1990s as Marja-Leena Loukola, Simo Isoaho, and Kaisa Lindström mention in their report on education for sustainable development in Finland from 2001:

The Finnish Council of State made a Decision-in-Principle on promotion of ecological sustainability in 1998. The Government Programme on Sustainable Development is Finland's third comprehensive document outlining national measures to be taken to promote sustainable development. In 1990, the Council of State presented a report entitled "Sustainable Development and Finland" to the Finnish Parliament. A second report was prepared by the Finnish National Commission on Sustainable Development in 1995, "Finnish Action for Sustainable Development." (2001, p. 11)

Already in the 1985 Core Curriculum for Basic Education, "the environment and nature protection" is listed as a central aim (Utbildningsstyrelsen, 1985). In 1991, the Finnish national commission of UNESCO published A National Strategy for Environmental Education where sustainable development was a topic in a subchapter on

environmental education. At the end of the decade, the National Board of Education arranged a theme evaluation concerning the state of sustainable development in Finnish schools and educational institutions (Rajakorpi and Rajakorpi, 2001). Furthermore, the Constitution of Finland (731/1999), which was approved in 2000 after a thorough reform of previous constitutional documents, declared that "nature and its biodiversity, the environment and the national heritage are the responsibility of everyone." Given this strong emphasis on nature and sustainability, it is remarkable that the Basic Education Act from 1998 (Finlex, 628/1998) does not mention sustainability, sustainable development, or nature. Environment is mentioned only in the context of a "safe activity environment" (Section 48d). The purpose of education is defined in the Act but in terms of social responsibility and capacity for learning, without mentioning the natural environment.

1. The purpose of education referred to in this Act is to support pupils' growth into humanity and into ethically responsible membership of society and to provide them with knowledge and skills needed in life. Furthermore, the aim of pre-primary education, as part of early childhood education, is to improve children's capacity for learning.
2. Education shall promote civilisation and equality in society and pupils' prerequisites for participating in education and otherwise developing themselves during their lives.
3. The aim of education shall further be to secure adequate equity in education throughout the country. (Section 2)

The reason that sustainability is absent in the law probably has to do with its age, since the Act of Early Childhood Education published twenty years later emphasises that education has to guide children towards ethically responsible actions (Finlex, Lag, om småbarnspedagogik, §3.8, 2018/540). Likewise, the Governmental regulation of upper secondary education from 2018 clearly emphasises sustainability (Finlex, Statsrådets förordning om gymnasieutbildning, 1 §, 2018/810). However, already the Government Decrees on the national goals of education and distribution of lesson hours in basic education from 2001 stipulates that the instruction shall promote the pupils' agency development and support them to be able to participate in the building of a just and sustainable society (Finlex, 2 §, 1435/2012). Much has also happened in the last few years. The Programme of Prime Minister Sanna Marin's 2019 government features the title "Inclusive and competent Finland – a socially, economically, and ecologically sustainable society" (Finnish Government, 2019). During this government, the Ministry of Education and Culture has developed its own sustainable development policy (Ministry of Education and Culture, 2020) with a section titled "Better knowledge, skills, and competence." Yet, even though it focuses on Goal 4 of Agenda 2030, two main concepts in this section are competence and lifelong learning. However, the section ends with the sentence: "The Government Programme also requires that sustainable development and gender equality education be taken into account as cross-cutting themes at different levels of education" (p. 9).

Specific for Finland are the many official strategies and policies, initially on environmental education and later on education for sustainable development and sustainability education (see Table 2). Large expert groups with a great variety of participants have negotiated the strategies. Many interest groups, primarily NGOs, have also cooperated in the promotion of sustainability in the schools. These groups

have published material, arranged seminars, provided teacher training, held meetings with governmental officials, written statements, and so on (see. e.g. Kupa, 2016–2017). A noted problem is the lack of regular evaluation of the implementation of strategies in educational practice and teacher education. It is, therefore, unclear how successful the strategies are. A doctoral study by Saloranta (2017) shows that the implementation of education for sustainable development in Finnish comprehensive schools varies a lot, regardless of a common core curriculum. The creation of a sustainable school culture is crucial to influence pupils' daily choices, according to the study. Likewise, the commitment and values of the school leaders and other staff members are most relevant for the successful implementation of sustainability in schools.

Curriculum framework

The term 'sustainable development' occurs in the National Core Curriculum for Basic Education for the first time in 2004 (Utbildningsstyrelsen, 2004). The word 'sustainable' occurs thirty-two times, in general followed by the word 'development,' 'lifestyle,' or 'solutions.' Basic values in the curriculum include human rights, equality, democracy, natural diversity, environmental viability, and culturalism, with one of the cross-curricular themes listed as "responsibility for the environment, well-being, and a sustainable development" (Utbildningsstyrelsen, 2004). The aim of this theme is to improve students' abilities and motivation to engage in the welfare of humans and the environment, and to foster environmentally committed citizens who are willing to build a future based on ecologically, economically, socially, and culturally sustainable solutions.

Sustainable development is further discussed in the subject sections on Environmental and Nature Studies (an integration of Biology, Geography, Physics, Chemistry, and Health Education in grades 1–4), Biology (grades 5–9), Geography (grades 5–9), Ethics, and only mentioned in Mother Tongue, Sámi Language, Foreign Languages, Social Studies, Visual Art, Home Economics, and Crafts. In Chemistry, the concepts of 'environment' and 'nature' appear, while 'environment' occurs a few times in Health Education and Religion; however, 'sustainability' is not present. In Mathematics, Gymnastics, and Music, there is no reference to 'sustainability,' 'environment,' or 'nature' as educational responsibilities.

In Environmental and Nature Studies, the students' social activities, interactions with the environment, and roles as citizens are in focus. Biology and Geography emphasise responsibility, nature, and habitat protection while supporting the students' development into active citizens committed to sustainable lifestyles. An aim of Biology in grades 7–9 is for students to learn how to find solutions to environmental changes in their own neighbourhoods. They should also understand the role of biodiversity for ecological sustainability. The aim of Geography in grades 7–9 is to be a bridge between social and scientific ways of thinking, so that students learn to reflect on scientific, cultural, social, and economic phenomena in combination. In Geography, students also learn to understand and critically reflect on global environment and development issues. In Ethics (only a subject for those who do not study any religion), students become familiar with human rights and sustainable development, learning to act responsibly towards themselves as individuals, towards other people, and towards society and nature. Interestingly, the aesthetics of nature is also mentioned.

Ten years later, in 2014, a new National Core Curriculum for Basic Education was published. In this document, sustainability is a basic aim (Finnish National Board of Education, 2016; Utbildningsstyrelsen, 2014). The phrase 'sustainable development' occurs already in the first paragraph and the schools are commissioned to build a sustainable future. The curriculum regards humans as a part of nature and dependent on vital ecosystems. According to the curriculum text, a sustainable lifestyle is necessary and basic education will lay the foundation for global citizenship and culturally sustainable development. The students need to understand the seriousness of climate change and to strive for sustainability. "Participation, involvement, and building a sustainable future" is one of the seven transversal competences which the students need to acquire. These competences link various fields of knowledge and skills to promote personal growth, studying, work, and activity, also in the future. In addition, sustainability is a core concept in the other six competences. A sustainable lifestyle is also one of the principles in the development of the organisational culture of the schools, and in school meals as the students receive free lunches through basic education in Finland. In the 2014 curriculum, sustainability is also included in most of the school subjects.

Even though the 2014 curriculum mentions the world 'sustainable' nearly 200 times – followed by the words 'future,' 'lifestyle,' 'development,' and several others that relate to sustainability – the concepts of sustainable development and sustainability are never adequately defined. Educators and policymakers at lower levels in the educational system must find out themselves what it means or how best to interpret it. This poses a problem since the interpretation may vary a lot from one person to another. The systematic approach which the extensive discussion of sustainability might indicate could, therefore, be lost.

The latest Finnish curriculum also contains the concept 'ecosocial Bildung' (translated in English to 'ecosocial knowledge') with a short description. The ideas behind the word 'eco-social' derive from eco-socialism and the philosophical thoughts of Karl Marx. Eco-socialism is a political red/green concept combining socialism and green politics. It asks for a social transformation and posits a strong objection to capitalism. The concept of eco-socialism has been used in English-speaking contexts (for example in the US and Australia since the 1980s) and in German-speaking countries (Ökosozialismus and the adjective ökosozial, often in relation to education and *Bildung*) (Borgnäs, Eskelinnen, Perkiö, and Warlenius, 2015; Löwy, 2015; Wagerer, 1992). However, having such a strong political background, this concept seems somewhat controversial in a national curriculum, especially without a thorough definition and explanation. This concept might even be in conflict with other values in the curriculum. This shows how complicated concepts may easily find their ways into the curriculum. Even though the aim is to aid teachers, undefined concepts may end up confusing curriculum users. The only place where the Finnish curriculum tries to describe sustainability is in relation to 'ecosocial Bildung.' However, this turns into a kind of circular argument:

Humans are part of nature and completely dependent on the vitality of ecosystems. Understanding this plays a key role in growth as a human being. Basic education acknowledges the necessity of sustainable development and ecosocial knowledge and ability, follows their principles, and guides the pupils in adapting a sustainable way of living. Sustainable development and ways of living comprise an ecological and economic dimension as well as a social and cultural dimension. The leading idea of ecosocial knowledge and ability is

creating ways of living and a culture that foster the inviolability of human dignity and the diversity and ability for renewal of ecosystems while building a competence base for a circular economy underpinned by sustainable use of natural resources. Ecosocial knowledge and ability means that the pupils understand the seriousness of climate change, in particular, and strive for sustainability. (Finnish National Board of Education, 2016, p. 16)

This text continues with the claim that humans have a responsibility to develop technology that maintains the future of humans and the environment. Students adopt this responsibility through a focus on environment-related conflicts between conservation and consumption. By studying social structures and solutions, students learn to understand their cross-generational global responsibilities. It is interesting to note that the word 'ecosocial' is totally absent in the latest core curriculum for upper secondary education, a policy document written in 2019 (Utbildningsstyrelsen, 2019). Yet, sustainability still has a strong position.

Sustainability is best anchored in Environmental Studies in grades 1–6 (an integration of Biology, Geography, Physics, Chemistry, and Health Education) and in Biology and Geography in grades 7–9. The only place in which the curriculum describes the different dimensions (ecological, social, cultural, and economic) of sustainable development is in the presentation of Environmental Studies. Even if the social dimension is obvious throughout the curriculum, it is not presented as a dimension of sustainability. Fundamental issues such as human rights, equality, and democracy are not only dealt with in the basic part of the curriculum, but more thoroughly in Social Studies and Ethics as something distinct from sustainability.

Agenda 2030 and the UNSDGs are absent in the Finnish National Core Curriculum from 2014, if the vague one-time mention of the UN's development goals in relation to global education among the general aims does not imply the UNSDGs. Yet, it could as well imply the Millennium Development Goals.

Global education as part of basic education contributes to creating preconditions for fair and sustainable development in line with UN development goals. (Finnish Board of Education, 2016, p. 19).

However, in basic education, global learning lays the ground for fair and sustainable development in accordance with the UNSDGs, since basic education has a role to positively influence both national and international development according to the 2014 curriculum.

The writing of the 2014 curriculum was a long and complicated process involving a huge number of authors. In this process, more than 300 researchers, teacher educators, educator providers, teachers, school leaders, and other school staff were heard personally (Halinen, 2013; 2014). The result is not a unified document with a clear focus or ideological foundation, but a document filled with replications and contradictions. Earlier curricula were strongly human-centred, setting people apart from nature and focusing more on social issues than the natural environment. In the 2014 curriculum, a more eco-centred worldview is presented where humans are described as belonging to nature and dependent on a vital ecosystem.

When comparing the curricula from 2004 and 2014 with respect to the framework from Sterling described above, it is obvious that on subject level the 2004 curriculum sometimes has a stronger focus on fostering responsibility and action competences (even if this concept not is used) than the 2014 curriculum. In 2014, the criteria for

evaluation in Biology, Geography, Chemistry, and Physics in grades 7–9 (slightly differently in the different subjects) states that pupils should know what is needed to act responsibly and what a sustainable lifestyle is. Here, the focus is on knowing rather than acting; students should be able to describe, but not to do. Moreover, in reading through the 2014 curriculum, it seems clear that although the authors have made an effort to include sustainability in all of the subjects, they do so often in a rather superficial way. One sentence or several sentences where sustainability is mentioned can be cut off without any difference for the overall meaning. It is obvious that sustainability has not been an important ingredient for all developers of the curriculum text. However, on a general level, the 2014 curriculum often emphasizes that the school shall promote the pupils' agency and train them to participate in society and contribute to a sustainable future. The school shall be a learning community supporting a sustainable way of living.

It is worth noting that the Finnish National Agency for Education (earlier, Finnish Board of Education) started a project on climate change education in 2019 (Opetushallitus, 2020). Built around a questionnaire circulated to teachers, students, parents, and other educational stakeholders (N=1456, 60% of them students), as well as a dialogue among educational staff from schools and preschools, the Agency together with various stakeholders create a vision and develop a climate action educational programme. Many questionnaire respondents regarded the values of society as the largest obstacle hindering the adaption of climate responsibility. However, this is a very ambitious programme, and hopefully not temporary.

According to the vision defined this year [2021], in 2025 climate responsibility is both a mode of action and a civic skill within the learning community. Climate responsibility becomes a reality through agency, daily actions, attitudes in education, and in continuous learning. It is not enough to reproduce what already exists, but climate change challenges us to renew our routines, to influence and address the systemic changes that are necessary. The planetary boundaries are the starting point on which a climate-responsible approach is based. (Opetushallitus, 2020, author's translation)

The responsibility for the implementation of the proposals is shared between several different actors. We hope that the proposals will correspond to the reference framework as a joint task and more precisely for genuine actions. The implementation requires providers of education and training, teachers, mentors, learners, leaders, principals, developers, researchers, organisations, workplaces, and the education administration and other dependants. (Opetushallitus, 2020, author's translation)

In accordance with their role, all actors will be responsible for ensuring that all points and goals are realised in daily life. (Opetushallitus, 2020, author's translation)

At present, also other agencies actively work to promote sustainability learning. In 2020, the Ministry of Foreign Affairs in Finland together with the Peace Education Institute have produced substantial online material and a book in Finnish and Swedish about how to work with Agenda 2030 and climate change in schools (Institutet för Fredsfostran, 2020).

4.3 Sustainability in Icelandic educational policy

To evaluate the Icelandic educational policy with respect to sustainability education (or its variants) in compulsory schools, we examine (1) the law governing this educational level (2008), (2) the national curricula, both the general section (2011) and the subject section (2013), and (3) a white paper on educational reform (2014). In our research, we draw partly on previous work by Ingólfur Ásgeir Jóhannesson (2017) who examined the national curricula with the subject sections for preschools, compulsory schools, and upper secondary schools with respect to "whether ideas relating to sustainability are similar or different in the various sections of the curricula" (p. 1).

In the current education act for elementary education in Iceland (Lög um grunnskóla, no. 91/2008), 'sustainability' (*sjálfbærni*) is not mentioned while 'environment' (*umhverfi*) appears six times but only once referring to the natural environment. Other occurrences refer to the learning environment or the environment in after-school centres. 'Nature' (*náttúra*), 'nature conservation' (*náttúruvernd*), and 'climate' (*loftslag*) also do not appear in the law. Thus, the law is silent on nature, the natural environment, and the climate as either an important subject or as an issue of concern for the educational system.

The law is, however, not entirely silent on sustainability issues, as the second article specifies that the objective of the elementary school, in cooperation with students' homes, is to "promote overall development of all students and their participation in an ever-changing democratic society." The article then continues to say that the daily work in schools should be shaped by

tolerance and kindness, Christian Icelandic cultural heritage, equality, democratic cooperation, responsibility, care, placability, and respect for human values. ... The elementary school should promote open-mindedness among its students and increase their competence in the Icelandic language, their understanding of Icelandic society, its history and characteristics, the living conditions of people, and the duties of the individual towards society, environment, and the global world. (Lög um grunnskóla, 91/2008)

This emphasis on democracy first appeared in the law governing compulsory education in 1974 and was accompanied by an extensive elaboration of democracy as an educational goal and working principle (Jónsson, 2019). In 2008, the critical climate of the 1970s had given way to a more managerial and neo-liberal ideology of schools. The national curriculum at the time (from 1999, slightly revised in 2007) does not really elaborate democracy as either an objective of the elementary school or as a working principle in the daily practice of teaching and learning. In fact, democracy as a curricular concern had turned into little more than a faint echo from the 1970s (Halldórsdóttir, et al., 2018; Jónsson, 2019).

A separate chapter of the law deals with educational content, organisation, course offerings, evaluation, and operating time. This section includes a list of twelve subjects or areas of study on which the national curricula should elaborate, one of which is "bodily and mental well-being, healthy living, and responsible conduct towards life and environment." This is the closest the law comes to saying something specific in the direction of sustainability education. Insofar as the law specifies what should be done, i.e. to the extent that it says something about educational content and working practices, it remains almost entirely within first order learning and the

cognitive domain. It is, however, worth bearing in mind that the law itself says little about this but points to a subsequent specification in the national curriculum.

The law was passed in June 2008 and came into effect July 1 the same year. Just over three months later, Iceland suffered heavily when the country's banking system almost entirely collapsed. Paul Krugman, a Nobel prize winner in Economics, described it as "one of the great economic disaster stories of all time" (Krugman, 2010). In the aftermath of the collapse, people took to the streets and demanded a thorough rethinking of the entire democratic system (Bernburg, 2016). The time was ripe for radical and critical thinking, unlike the previous decades when educational system had moved in a managerial and neo-liberal direction. The critical wave extended all the way to the Ministry of Education, Science and Culture which, in 2011, published new national curricula for preschools, elementary schools, and upper secondary schools, where sustainability, along with democracy and human rights, equality, creativity, literacy, and health and well-being were defined as fundamental pillars of all education (Hannesdóttir, 2013; Jónsson, 2018).

Curriculum framework

In the new curricula, 'sustainability' appears thirty-four times (not counting index and headings); it is referred to in the introduction by the minister (p. 5), in an introduction to the idea of the fundamental pillars (pp. 14–16), and then in a section dedicated to sustainability as one of the six pillars (pp. 18–19). In this section, a definition of sustainability similar to the one from Our Common Future (World Commission on Environment and Development, 1987) is given.

Education towards sustainability aims at making people able to deal with problems that concern the interaction of the environment, social factors, and the economy in the development of society.

The most common understanding of the concepts 'sustainability' and 'sustainable development' involves that we leave the environment to our descendants in no worse condition than we received it, and that we endeavour to meet the needs of the present without reducing the possibilities of future generations to meet theirs. This also refers to the definition of sustainability that it is a balanced situation and that sustainable development is the process of change when society, or a smaller unit, is developing towards sustainability. (Ministry of Education and Science, 2012)

After discussing sustainability, the section concludes with two paragraphs on 'education for sustainability.'

Education for sustainability encompasses creating a society of collective responsibility where individuals develop as active citizens, conscious of their own values, attitudes, and feelings for global impact and equality of all the inhabitants of the earth, for nature and the environment, for democracy, human rights and justice, for equality and multiculturalism, for welfare and health, and for economic development and vision of the future.

Education for sustainability further encompasses that, in their studies, children and youth come to grips with diverse problems and points of controversy. Teaching and working methods of the school are to be interwoven with the idea that the aim of education is capability for action [i.e. action competence]. This involves training in democratic working methods and that children and youth

are trained to be interested in and want to take part in society.

This is further developed in a section on the learning outcomes that students should have attained at the completion of compulsory school. The learning outcomes are divided into three categories: (a) knowledge, (b) skills, and (c) values and competences. In the first two categories, sustainability is explicitly mentioned:

Students have acquired:

- knowledge concerning the Icelandic environment in a global context (e.g. culture, society nature, sustainability).

Students have acquired skills to:

- treat their environment with sustainability in mind.

In the section on competences and values, the word 'sustainability' does not appear although a few elements capture central aspects of the concept.

Students:

- respect the values of life, human rights, and equality,
- show respect for the environment in a global context,
- and have acquired a competence to be active and responsible citizens in a democratic local community and in society as a whole. (p. 39)

The curriculum explicitly links the concept of sustainability to three of the other pillars of education. In the section on sustainability, the pillar is explicitly linked to equality in the following way:

From a social perspective, this ideology concerns equality, both intragenerational and transgenerational. In order to obtain equality, democratic methods have to be employed, the diversity of mankind respected, and multiculturalism ensured. Diversity is a source of strength that can eradicate poverty, contribute to peace, and secure living conditions and quality of life for all, wherever they live in the world. (p. 18)

In the section on democracy and human rights, sustainability is related to social cooperation. "Active cooperation with the local community within the municipality or area is required, but such cooperation is one of the key factors of sustainability. It is essential for democratic schools to take part in this way in creating a sustainable society of collective responsibility" (pp. 18–19). Sustainability is also linked to the pillar of creativity through the concept of problem-solving. "Creativity not only concerns something new and original but also utilises what already exists. It encompasses task solutions and search for new possibilities. This harmonises well with education towards sustainability and literacy in the widest sense" (p. 22).

It is evident here that the curriculum from 2011 (English translation from 2012) puts forth a strong emphasis on sustainability understood in a way similar to the one given in the Brundtland report from 1987. Furthermore, the educational paradigm clearly goes beyond first order learning in Sterling's sense, i.e. beyond the cognitive domain, to include second order learning (the intentional domain) by highlighting action competence as an aim of education for sustainability. That the curriculum goes beyond the first level is perhaps most evident in its emphasis on "the role of schools to develop active and responsible students along with their capability to

make decisions. Focus shall be on critical examination of issues rather than teaching specific knowledge" (Jóhannesson, 2017, p. 3; see also Pálsdóttir, 2014). There is, however, no clear indication of the curriculum advancing towards third order learning and change, i.e. the educational paradigm does not prescribe a "transformative level of learning, both at individual and whole society levels, that radical movement towards sustainability requires" (Sterling, 2001, Kindle location 168). Furthermore, the Ministry did not initiate much implementation of the policy apart from short books published on each of the six pillars (see e.g. the book on sustainability: Helgadóttir, 2013).

After a change of government in 2013, a new Minister of Education published a White Paper on Educational Reform in 2014. This document takes a sharp turn away from the social and environmental emphasis of the 2011 curricula towards a more individualistic and narrow conception of education with literacy and drop-out reduction being the primary concerns (Halldórsdóttir, Jónsson, and Magnúsdóttir, 2016; Dýrfjörð and Magnúsdóttir, 2016). The word 'sustainability' appears once in the entire document (forty-seven pages) in an introductory text describing international discourse about important individualistic competences. The words 'nature,' 'environment,' 'human rights,' and 'citizenship' do not appear.

4.4 Sustainability in Norwegian educational policy

In Norway, Environmental Education (EE) has been part of schools' curricula since the 1970s. However, the concept of Education for Sustainable Development (ESD) was not introduced until after the UN Conference on Environment and Development held in Rio de Janeiro in 1992. To evaluate the Norwegian educational policy with respect to ESD (or its variants) in compulsory schools, we examine (1) a white paper concerning Norwegian strategy for sustainable development (2007), (2) a policy report concerning competence in the future (2020), (3) the law governing this educational level (1998), (4) a policy report concerning student knowledge for a common future (2012), (5) a policy report concerning a 'school of the future' with suggestions of subjects and competences renewal (2015), and (6) a white paper about subjects, specialisations, and understanding (2016).

In Norway, a white paper called National Strategy for Sustainable Development (2007) was published as part of the National Budget for 2008. The Strategy focuses on how Norway can contribute to sustainable development globally, and on how to ensure sustainable development nationally. It also states that Norway should be a leading country when it comes to sustainable development. The concept of 'sustainability' is addressed 213 times, and the other concepts to which sustainable development is linked when mentioned include environment, industry, economics, and politics. The precursor goals to the UNSDGs, i.e. the United Nations Millennium Development Goals (UNMDGs), are mentioned in this paper.

The white paper provides an overarching strategy for sustainable development across all sectors, including education. The report *Fremtidige kompetansebehov III* (*Competence in the future*) (Kunnskapsdepartementet, 2020) is also an overarching document when it comes to education for sustainable development. This report was submitted to the Ministry of Education in early 2020 and states what kind of competences we need in the future – competences that are both relevant for

education and for life in general. Primary, secondary, and higher education levels are addressed in their own sections. 'Sustainability' is mentioned twenty-six times and is linked to the concept of life skills. The UNSDGs are also mentioned in this document.

In addition to these overarching documents, there are several laws and documents concerning primary education. First, in the current Education Act (*Opplæringsloven*) (1998) sustainable development is not directly addressed. Neither sustainability nor the UNSDGs are mentioned. The law is, however, not entirely silent on sustainability issues, as the introduction states that "[t]he pupils and apprentices shall learn to think critically and act ethically and with environmental awareness."

There are several other educational documents concerning sustainability, for instance the report Knowledge for a common future (*Kunnskap for en felles framtid*) (2012) submitted to the Ministry of Education. This was an audit and further development of the Strategic Plan for Sustainable Development Education 2005–2010, and the strategy applied to the period 2012–2015. It included kindergarten, primary, and secondary education and teacher education. The document clarifies the content of ESD and addresses both the opportunities and challenges in regard to teaching and learning about sustainable development. 'Sustainability' is mentioned 138 times together with the following concepts: human rights, democracy, critical thinking, and climate. The UNSDGs are not directly mentioned.

Starting in 2013, the Norwegian government appointed a committee (chair, Sten Ludvigsen) to assess the subjects in primary and secondary education and training in terms of the requirements for competences in future working life and society. The work of this committee was reported in two documents titled *Elevenes læring i fremtidens skole: Et kunnskapsgrunnlag* (Pupils' learning in the school of the future) (Kunnskapsdepartementet, 2014) and *The School of the Future: A renewal of subjects and competences (Fremtidens skole: Fornyelse av fag og kompetanser)* (Kunnskapsdepartementet, 2015). The committee's reports highlight the need for students' learning to provide them the abilities to respond to complex challenges in the real world. Sustainable development is noted as one of the most critical challenges. In the report *The School of the Future* in-depth learning is emphasised:

The goal for pupil development of competence in subjects is that they should be able to *apply* it, i.e. that they should be able to use knowledge and skills to solve tasks and master challenges, cognitively, practically and in communication with others. Knowledge about when one can use what one has learnt and skills relating to how to do this are a result of in-depth learning. Hence, in-depth learning and competence development are closely linked. In many cases, acquiring competence requires in-depth learning. (Kunnskapsdepartementet, 2015, p. 43)

Following this, the committee recommends the establishment of three interdisciplinary themes – sustainable development, citizenship and democracy, and public health and life skills – as cross-cutting themes to which all subjects should respond. In this document, 'sustainability' is mentioned twenty-one times, and other concepts with which sustainable development is mentioned are climate change, personal economy, and natural resources. The UNSDGs are not explicitly mentioned.

From 2017, a process for curriculum renewal began in Norway, with the new curriculum to be enacted from the 2020–2021 school year. In April 2016, the white

paper *Fag – Fordypning – Forståelse: En fornyelse av Kunnskapsløftet* (Subjects – Specialization – Understanding: A renewal of the promotion of knowledge) was published by the Ministry of Education (Kunnskapsdepartementet, 2016). In this white paper, the inclusion of these three interdisciplinary themes was given clear mandate, and this has led to the inclusion of sustainable development as an interdisciplinary priority focus within the new curriculum. The three interdisciplinary and overarching themes will be implemented in all subjects and also act as a link between subjects in the new curriculum. 'Sustainability' is mentioned sixteen times in this document, and other concepts to which sustainable development is linked are climate/climate change, democracy, real life skills, human rights, and needs. The UNSDGs are not mentioned.

The new curriculum, LK20 (2020) is the biggest change since Knowledge promotion (Kunnskapsløftet) was introduced in 2006. Under the previous curriculum, sustainable development was a topic that was included in the teaching contents of a small number of subjects (especially in relation to climate change in the Natural Sciences and consumer education in the Social Sciences). A national priority is and has been the Sustainable Backpack, initiated by the Ministry of Education and Research and the Ministry of Climate and Environment to support Norwegian schools to implement ESD. The aims of the Sustainable Backpack are to influence attitudes toward, reconstruct ideas about, and improve proficiency in issues related to sustainable development among teachers and students in primary and secondary schools. ESD is supported in numerous ways, such as networking between teachers, schools, and science education experts; professional development among teachers and courses; and economic support given to school projects.

Curriculum Framework

The new curriculum, LK20 (2020), will be introduced in Norway in the 2020–2021 school year. Subject renewal (LK20) contains a core curriculum, which applies to all subject curricula from grades 1–10 and describes the values and principles on which basic education should be based. The core curriculum elaborates on the core values of the Education Act (1998) and the overriding principles for primary and secondary education. Moreover, the core curriculum sets the overall direction and foundation of the subjects' curricula. The specific learning contents, objectives, and competency progressions are set in the subjects' curricula for each subject individually. The subjects' curricula include the following parts: each subject's relevance and central values, core elements, interdisciplinary topics, basic skills, and competence aims and assessment. In competence aims and assessment, there is a list of student competence aims following the second, fourth, seventh, and tenth grades.

The core curriculum identifies the three "interdisciplinary themes" as overarching themes that should be addressed across all subjects. The interdisciplinary themes and sustainable development are described in the following way:

School shall facilitate for learning in the three interdisciplinary topics health and life skills, democracy and citizenship, and sustainable development. These three interdisciplinary topics in the curriculum are based on prevailing societal challenges, which demand engagement and effort from individuals and local communities, nationally and globally. The pupils develop competence in connection with the interdisciplinary topics by working with issues from various subjects. They shall gain insight into challenges and dilemmas in these topics. Pupils must understand where we can find solutions through knowledge and

collaboration, and they must learn about the relationship between actions and consequences.

Thus, sustainable development is classified as one of three interdisciplinary themes to be addressed across the curriculum. The three themes aim to enable learners with the capacities to apply their learning to address the complex social challenges of the 21st century. As such, these themes also connect closely with the idea of 'social forming' which is a key perspective of the curriculum and, through this, connect with developing appreciation of the natural and cultural heritages of the country.

Sustainable development is described in the following way in the core part of the curriculum.

Sustainable development as an interdisciplinary topic in school shall help the pupils to understand basic dilemmas and developments in society, and how they can be dealt with. Sustainable development refers to protecting life on earth and providing for the needs of people who live here now without destroying the possibilities for future generations to fill their needs. Sustainable development is based on the understanding that social, economic and environmental conditions are interconnected.

Furthermore, the curriculum states that our lifestyles and resource consumption have local, regional, and global consequences and because of this, students must learn to understand that all individual activities and choices are significant. In addition, it states that sustainable development includes issues relating to the environment and climate, poverty and distribution of resources, conflicts, health, equality, demographics, and education. Moreover, in this theme pupils shall learn about the different aspects of sustainable development, including technology. Technological competence and knowledge about the links between technology and the social, economic, and environmental aspects of sustainable development are thus key discussion points here.

The interconnection between economic, environmental, and social dimensions is repeated in the subject curricula, particularly in Social Science. In the description of core values of Social Science, for instance, it says:

In Social Science, the interdisciplinary theme of sustainable development is about the pupils understanding the connection between the social, economic and environmental aspects of sustainability. Knowledge about connections between nature and society, about how humans affect the climate and the environment, and how living conditions, ways of living, and demographics are related will contribute to this understanding. In Social Science, students should reflect on and discuss the dilemma and tension associated with the different dimensions of sustainable development and see that actions at both individual and community levels are important.

Moreover, the curricula identify a diversity of geographical coverage in relation to sustainable development. The point that people's way of living and use of resources have consequences locally, regionally, and globally is mentioned in the core curriculum, Social Science curriculum, and Natural Science curriculum. In Natural Science, sustainable development and geographical coverage are mentioned in the following way:

In Natural Science, the interdisciplinary theme sustainable development should give students the skills to make environmentally conscious choices and actions,

and see these in the context of local and global environmental and climate challenges.

Concerning the inclusion of local contexts in education, the core curriculum emphasises this in the following way:

By using diverse learning arenas, the school can provide students with practical and lifelong experiences that foster motivation and insight. The involvement of the local community can contribute positively to the development of the school and pupils.

The local context is emphasised particularly in Natural Science. For instance, in Natural Science in early school years, the curriculum states that students should be able to "explore a local area and discuss sustainable use of the area" and "explain the importance of biodiversity and implement measures to preserve biodiversity in the local environment."

Another important aspect concerning sustainable development is to what extent knowledge components or topics related to this issue are to be covered in the subjects' curricula. There are relevant knowledge components and topics related to sustainable development incorporated in the curricula for many individual subjects, for example:

- be aware of all aspects of sustainable development in Social Science;
- get to know and be aware of biodiversity, technology and energy use, and climate change in Natural Science;
- reflect ethically on nature and man's place in it, and reflect on how people, the environment, and society influence each other in Christianity, Religion, and Ethics;
- be aware of repair, reuse, and sustainable materials in Art and Handcraft;
- understand recycling and sustainable diet in Home and Consumer Studies;
- orient oneself in the local environment in Physical Education and Health;
- and reflect on how texts represent nature, environment, and living conditions in Norwegian.

Sustainable development is explicitly linked in several of the competence aims and the development is set out in a progressive manner. The assessment guidance in the subjects is clearly linked to the subjects and not to the interdisciplinary themes, thus not explicitly to sustainable development. However, a few of the descriptions can be indirectly linked to sustainability-related competences and skills. For instance, this description from Social Science, grades 3–4 (primary school):

Students show and develop competence when presenting and discussing Social Science questions and reflect on what kind of information and knowledge different sources can provide about the question. Students show and develop competence as they take different perspectives and see how they themselves and others can be influenced by and influence each other, society, and nature.

There are both explicitly linked and additional sustainability-related topics in the subjects. For instance, students should, according to the subject curriculum in Norwegian, be able to "use professional language and argue objectively in discussions, oral presentations, and written presentations in Norwegian and interdisciplinary topics." This competence aim in Norwegian is implicitly linked to sustainable development because argumentation and oral skills are important

competences related to sustainable development issues.

Concerning competences or skills that are to be covered in relation to sustainable development, there is a separate section on critical thinking and ethical awareness in the core curriculum.

Training should give the students an understanding of critical and scientific thinking. Critical and scientific thinking involves using reason in an investigative and systematic way in the face of specific practical challenges, phenomena, statements, and forms of knowledge ... Ethical awareness is weighing different considerations against each other and is necessary to be a reflective and responsible person. The training will develop the students' abilities to make ethical assessments and familiarise themselves with ethical issues.

Moreover, it emphasised that working with complex issues (related to sustainable development) can help students develop relevant competence. The curriculum says that students will work to find solutions, and they will learn about the connections between actions and consequences. This will be necessary both in order to learn special skills, but also to develop critical thinking and good values. For the interdisciplinary themes, the core curriculum specifically emphasises the importance of problem-solving (and that this should be incorporated into subject-level competence goals): "Pupils must understand where we can find solutions through knowledge and collaboration, and they must learn about the relationship between actions and consequences." In the interdisciplinary theme Democracy and Citizenship (Core Curriculum, 2.5.2), active citizenship is mentioned in this way: "The school shall stimulate the pupils to become active citizens, and give them the competence to participate in developing democracy in Norway."

There is no clear guidance on whole-school or whole-systems approaches in the curriculum, but there is discussion about each school taking responsibility for establishing a good learning environment and learning culture, as well as collaboration between school and home. In addition, the students' active participation in their own learning is emphasised.

4.5 Sustainability in Swedish educational policy

ESD has been a focus area within the Swedish education system for a considerable amount of time; sustainable development was included in national curricula as far back as 1994, and in 2006 the Higher Education Act was amended to include sustainable development as something to be promoted (Östman and Östman, 2013). Prior to this, Sweden has a long-standing tradition with environmental education, to which ESD has added an emphasis on the interconnections between environmental, social, and economic issues. A specific government committee for ESD was formed in 2003 in order to review and analyse the inclusion of sustainable development within the Swedish education system (Kommittén för utbildning för hållbar utveckling, 2004). In 2006, the government established the Swedish International Centre of Education for Sustainable Development (SWEDESD), a research environment intended to support the work of the UN Decade of Education for Sustainable Development, and subsequently the UNESCO Global Action Programme (GAP) on Education for Sustainable Development (ibid.). In addition to this, a number of parliamentary motions have been put forward in recent years

seeking to strengthen and expand the work being done on ESD, for instance by requesting increased funding and assignments for the National Agency of Education in this area. The first three of these motions were rejected, with the government pointing to the work already carried out in this area (The Swedish Government, 2013; 2014; 2017; 2019).

The Education Act of 2010 is the main legal document concerning the Swedish school system, with Chapter 10 dealing specifically with the compulsory school. Although there are no direct references to sustainable development / ESD within the Education Act, the initial regulations outlined in Chapter 1 do include sustainable development / ESD-related concepts. For example, it is stated that education should promote respect for human rights and that there should be no discrimination, i.e. on the basis of gender or ethnicity, which limits access to education, and this can be connected to the social dimensions of sustainable development (The Swedish Government, 2010).

Based on a review of documents relating to ESD policy discussions in Sweden, the following table presents the various institutional actors involved in this area. Out of these seventeen institutional actors, nine can be said to have primary focus on education, while the remaining eight are mainly focused on areas outside of education. In the table a distinction is made between governmental and government-linked education focused actors, however SWEDESD and UNESCO can still be seen as somewhat governmental, albeit less directly involved in policy making and implementation.

Table 6: *Institutional actors involved in ESD policy discussions in Sweden*

Governmental and education focused	Governmental and not education focused	Government linked and education focused	Non-governmental and not education focused
The Ministry of Education (<i>Utbildnings-departmentet</i>)	EPA (<i>Naturvårdsverket</i>)	The Swedish International Centre of ESD (SWEDES) – Uppsala University	Swedish Society for Nature Conservation (<i>Naturskyddsföreningen</i>)
The National Agency of Education (<i>Skolverket</i>)	Ministry of Foreign Affairs (<i>Utrikes-departmentet</i>)	UNESCO	Keep Sweden Tidy (<i>Håll Sverige Rent</i>)
Swedish Higher Education Authority (UKA, <i>Universitetskanslers ämbeter</i>)	The Department of Finance (<i>Finansdepartementet</i>)	The ESD Network (LHU, <i>Nätverk för Lärande för Hållbar Utveckling</i>)	WWF Sweden (<i>Svenska Världsnaturfonden</i>)
The Education Committee (<i>Utbildningsutskottet</i>)	Politicians		
The Committee for ESD (<i>Kommitén för utbildning för hållbar utveckling</i>)	The Agenda 2030 Delegation (<i>Agenda 2030 delegationen</i>)		
Swedish Council for Higher Education (<i>Universitets och högskolorådet</i>)			
The Global School (<i>Den Globala Skolan</i>)			

Among the numerous reports published by some of these institutional actors on the topic of ESD in Sweden, one of the most influential has been *To Learn for Sustainable Development* (The Committee for ESD, 2004). The report argues for the importance of ESD in preparing young people for future challenges, and states that the content of ESD should be based on both global and local perspectives. The report also argues that ESD should include characteristics such as: interdisciplinary working methods clarifying conflicts of interests, a broad spatio-temporal perspective, democratic working methods, 'reality-based' learning, and an emphasis on problem-solving and critical thinking. As the following section will show, many of these characteristics are now present within the national curriculum for the compulsory school.

Curriculum framework

The curriculum for the compulsory school in Sweden has five chapters (The National Agency of Education, 2018). In chapter one, 'Fundamental values and tasks of the school,' four perspectives are described with which schools are to provide pupils – historical, environmental, international, and ethical. The descriptions of these perspectives include ESD-related qualities such as "an understanding of the present,

and a preparedness for the future," the "ability to think in dynamic terms," the "ability to form personal standpoints and to act responsibly towards themselves and others," and "responsibility for the environment in areas where they themselves can exercise direct influence." These four perspectives can thus be seen as establishing an orientation towards ESD within the curriculum for the compulsory school.

Although no specific definitions of sustainable development, sustainability, or ESD are given in the curriculum and the UNSDGs are not addressed explicitly, many knowledge components and topics of relevance to ESD are covered, and sometimes an explicit link with sustainable development is made. The subjects and topics in the curriculum where an explicit link to sustainable development is made are:

- in Home and Consumer Studies, sustainable consumption (p. 48);
- in Biology, social-ecological perspectives (p. 168);
- in Physics and Technology, the role and impact of technology (p. 176);
- in Chemistry, energy and natural resources (p. 197);
- and in Geography, sustainable lifestyles and behaviour (p. 205).

When sustainable development is directly referred to within the curriculum, it appears that an environmental perspective is most often being taken. However, social dimensions of sustainable development are also included. For example, the core content of Home and Consumer Studies includes "the purchase of clothes, food, and travel from the perspective of economic, social, and environmental sustainability" while the Civics curriculum refers to "sustainable social development" (pp. 44, 227). The social dimension of sustainable development is also represented implicitly through the curriculum's consistent emphasis on issues such as gender equality, democratic values and human rights, and equality and non-discrimination. The economic dimension of sustainable development arguably receives the least attention in the curriculum, although subjects such as Civics do include topics such "how different regions' economies are changing in a globalised world" and "causes and consequences of prosperity and poverty" which can be seen as relevant to the economic dimension of sustainable development (pp. 232, 230).

In addition to these knowledge components, the curriculum also includes values and attitudes which can be connected to ESD. For instance, the 'Fundamental values' described in the first chapter emphasise respect, compassion, and empathy for others; empathy and solidarity are also highlighted within the 'Overall goals and guidelines' chapter. Another value which is promoted in the curriculum is social justice, particularly with regard to topics of gender equality and non-discrimination, both of which are highlighted in the curriculum. The values of citizenship and stewardship are also included. For example, Civics aims to "give pupils opportunities to develop their understanding of what it means to be an active, responsible citizen in a rapidly changing society," while the Overall Goals and Guidelines mention "respect and care for both the immediate environment, as well as the environment from a broader perspective" (pp. 227, 10). There are also numerous ESD-related competences and skills featured in the curriculum, although a connection between these and sustainable development / ESD is not usually made explicit. Some examples of such competences and skills are "a holistic perspective" and the "ability to critically review information, facts, and relationships" (pp. 198, 208, 9). Anticipatory competences are also alluded to in the description of an historical perspective in the first chapter of the curriculum, where it is stated that pupils should "develop an understanding of the present, and a preparedness for the future,

and develop their ability to think in dynamic terms" (p. 8).

The curriculum also encourages students to connect real-world actions and behaviours to sustainable development. The Fundamental Values and Tasks of the School states that it should stimulate students' "desire to translate ideas into action" and give them "the opportunity to take initiatives and assume responsibility," while the Overall Goals and Guidelines states that the school should ensure that students "can use knowledge from scientific, technical, social science, humanistic, and aesthetic areas of knowledge for further studies, in societal and everyday life," and, as mentioned in the previous section, should be able to "solve problems and transform ideas into action in a creative and responsible way" (pp. 8, 11). This chapter also states that pupils should have "an understanding of the importance of the individual's own lifestyle and its impact on health, the environment, and society" (p. 12). Similarly, the Home and Consumer Studies curriculum aims to help pupils "assess choices and actions in the home and as a consumer... from the perspective of sustainable development," while the Geography and Social Sciences curricula specify that pupils should "describe how various actions in everyday life can affect the environment, and on the basis of this provide proposals that can contribute to sustainable development" (pp. 42, 203).

A problem-solving and solutions orientation to learning is also encouraged in the curriculum. The Fundamental Values and Tasks of the School states that it should allow pupils "to translate ideas into action and solve problems" and that, by the end of their education, pupils should be able to "solve problems and transform ideas into action in a creative and responsible way" (pp. 8, 11). The phrase 'solve problems' appears a total of fifty-nine times in the curriculum, and this attribute is sometimes explicitly connected to sustainable development. For example, one of the teaching goals in the Technology curriculum is that pupils can "identify problems and needs that can be solved by means of technology, and work out proposals for solutions" as well as 'assess technical solutions and relate these to questions concerning aesthetics, ethics, gender roles, the economy, and sustainable development" (p. 296).

With regard to the role education plays in social learning and societal formation, the Fundamental Values and Tasks of the School states that democratic working forms should "be applied in practice and prepare pupils for active participation in the life of society" (p. 7). Part of the overall guidelines for teachers is also that they "prepare pupils for participating and taking responsibility, and applying the rights and obligations that characterise a democratic society" (p. 14). Additionally, it is stated that the school should "promote the all-round personal development of pupils into active, creative, competent, and responsible individuals and citizens" (p. 7). The curriculum for Civics also aims to give pupils an "understanding of what it means to be an active, responsible citizen in a rapidly changing society" (p. 227). Moreover, when describing its 'Environmental perspective' the Fundamental values chapter states that "[t]eaching should illuminate how the functions of society and our ways of living and working can best be adapted to create sustainable development" and the curriculum for Biology also refers to opportunities for "citizens of society to contribute to sustainable development" (pp. 8, 169). Thus, the role of education in bringing about social change is connected somewhat explicitly to sustainable development.

Effort is made to include both local and global perspectives in the curriculum. For instance, the Biology curriculum includes knowledge requirements such as the

"[i]mpact of people on nature, locally and globally" and "[t]he local ecosystems in comparison with regional or global ecosystems," while Chemistry includes "[p]eople's use of energy and natural resources, locally and globally, as well as what this means in terms of sustainable development" (p. 191). Civics, on the other hand, includes teaching aims such as the ability to "analyse and critically examine local, national, and global societal issues from different perspectives" (p. 228). The balance between these levels appears fairly even in the curriculum; the local and the global are presented as connected spheres and are both given relatively good coverage. While some room is left open in the curriculum with regard to local contexts, global themes which are featured include globalisation, industrialisation, and climate change.

With regard to including local contexts within education, the curriculum states that each school's development should be pursued in close contact with the local community, and that a high-quality education "presupposes close cooperation between working life and the local community" (p. 15). The curriculum also states one of its goals as being for students to have "insight into the local community, its organisations, cultural life, and associations" (ibid.). Additionally, the curriculum acknowledges that "equivalent education does not mean that the education should be the same everywhere" and that there are "different ways of attaining these goals" (p. 6). Engagement with local contexts and surroundings is incorporated in the curricula for many individual subjects, for example:

- analysing local images in Art;
- understanding local recycling in Home and Consumer Studies;
- orienting oneself in the local environment in Physical Education and Health;
- local flora and fauna and ecosystems in Biology;
- local energy use and natural resources in Chemistry;
- local history, religion, and occupations in Social Science subjects;
- local field studies and data collection in Geography;
- and local political institutions and decision-making processes in Civics.

An explicit link between studying local contexts and sustainable development is made in the Chemistry curriculum, which features in its core content "[p]eople's use of energy and natural resources, locally and globally, as well as what this means in terms of sustainable development" (p. 191). Physics includes a similar knowledge requirement. Sustainable development is also explicitly connected to "everyday choices" or "ethical-environmental choices and prioritisations in everyday life" in Home and Consumer Studies and Geography, which can be seen as implying the local context (p. 204). Part of the core content for Biology is also the "[i]mpact of people on nature, locally and globally" and "[o]pportunities for consumers and citizens of society to contribute to sustainable development" (p. 169).

The curriculum does not make direct references to inter/multi/transdisciplinary approaches to education. However, the section 'Responsibility of the Headteacher' in the Overall Goals and Guidelines chapter does include points which can be seen as encouraging such an approach. For example, "teaching in different subject areas is coordinated such that the pupils are provided with opportunities to understand larger domains of knowledge as a whole" and "teaching in different subjects integrates cross-disciplinary areas of knowledge, such as the environment, traffic, gender equality, consumer issues ..." (p. 17). These points suggest that students should be able to draw on multiple disciplinary perspectives to more broadly understand a large-scale issue or phenomenon. Sustainable development is not

directly linked to this attribute; however, it can be seen as being indirectly linked through the provided examples of cross-disciplinary knowledge: "environment, traffic, gender equality, consumer issues." The fact that a number of individual subjects include disciplinary questions relating to sustainable development also suggests that this is one of the "larger domains of knowledge" which pupils are to understand.

Student-centred and active learning both feature to some extent in the curriculum. The Fundamental Values and Tasks of the School state that "[t]eaching should be adapted to each pupil's circumstances and needs. It should promote the pupils' further learning and acquisition of knowledge based on pupils' backgrounds, earlier experience, language, and knowledge" (p. 6). The school is also to "emphasise the importance of forming personal standpoints and provide opportunities for doing this" (ibid.). This chapter also states that "[c]reative and investigative activities and play are essential components of active learning," while "practical investigative work" is included in all three Natural Science curricula, which can be taken as encouraging active learning (p. 8). Student-centred and active learning is connected somewhat explicitly to sustainable development in the Natural Science curricula. The Biology curriculum states that "[t]eaching should give pupils opportunities to use and develop knowledge and tools for expressing their own arguments and examining those of others in contexts where knowledge of biology is of importance. As a result, pupils should be given the preconditions to manage practical, ethical, and aesthetic situations involving health, use of natural resources, and ecological sustainability" (p. 166). Similar passages feature in the Chemistry and Physics curricula.

Boxes 1–5: Structure and parts of curriculum framework (individual descriptions per country)

1. Denmark: Structure and parts of curriculum framework

1) The curriculum for compulsory schools in Denmark is difficult to divide into different levels or make illustrative through a hierarchy. However, we have attempted in the following to make four bullets that represent different focus points at the Danish Folkeskole. We do not have a specific curriculum that is mandatory to follow, but there are plenty of guidelines, objectives, and educational material that teachers and schools can use voluntarily. The goals, however, are mandatory.

National Goals consist of:

- The public school must challenge all students to become as proficient as they can be;
- primary school should reduce the importance of social background in relation to academic results;
- and the confidence to and the well-being in primary schools must be strengthened, among other things, by respecting professional knowledge and practice.

The targets are operationalised in the following target figures:

Objective 1: The proportion of the most capable students in Danish and Mathematics must increase year by year. The public school must challenge all students to become as proficient as they can be. At least 80% of students must be good at reading and counting in the national tests.

Objective 2: The percentage of students with poor results in the national tests for reading and maths must be reduced year by year. Primary school should reduce the importance of social background in relation to academic results.

Objective 3: Increase student well-being. Confidence and well-being in primary schools must be strengthened, among other things, by respecting professional knowledge and practice.

To conclude this first pillar, we mention that all data is collected and can be found visible at The Ministry's data warehouse which gives everyone – schools, municipalities, and parents – access to the relevant figures, including the target figures (<https://uddannelsesstatistik.dk/pages/grundskolen.aspx>).

2) The second bullet in the Danish compulsory school is Common Goals (*Fælles mål*). Since 2001, there has been a huge shift in how the primary school is "managed." First came the introduction of Clear Goals, later named Common Goals. These goals were

further developed and made simpler in 2015/2016 so that the extent of the goals focuses more on the learning outcome for each individual.

About Common Goals

Common objectives are national goals that describe what students should learn in each subject as well as kindergarten class.

Common Goals consist of:

subject objectives, competence goals, underlying skills and knowledge areas, as well as indicative skills and knowledge objectives. In selected areas of the subjects Danish and Mathematics, "points of attention" have been established. Specific guidance is given for the teaching and progression in each subject. There are twenty in total: Arts, Biology, Danish, Danish as a Second Language, English, French, Physics/Chemistry, Geography, History, Crafts and Design, Athletics/Sports, Christianity Education/Religion, Culinary Arts, Mother Tongue Tuition, Mathematics, Music, Nature and Technology, Social Science, and German. Here a complete list of all the focus points that are related to each subject can be found: (<https://emu.dk/grundskole>).

Guidelines and a link to all the subjects can be found here:

<https://www.retsinformation.dk/Forms/R0710.aspx?id=199860#ida7cea4f1-ec42-437d-a7a7-40f72002b42a>

3) In Danish and History, there are canon lists (*kanon lister*) that cover a broad spectrum on specially chosen themes or topics. In History, canon lists are made to help the chronological overview and contextual understanding. They are meant to be part of the topics and themes of the teaching when appropriate. There is no requirement that the points be reviewed chronologically, but all twenty-nine points must be included during the course of the school.

4) All subjects include three cross-cutting topics: IT and media, linguistic development, and innovation and entrepreneurship.

2. Finland: Structure and parts of curriculum framework

The Finnish National Core Curriculum for Basic Education was published in Finnish and Swedish in 2014, and had to be implemented by the latest in 2016. It was also published in English (Finnish National Board of Education, 2016). Local curricula had to be introduced for grades 1–6 in 2016, for grade 7 in 2017, for grade 8 in 2018, and for grade 9 in 2019.

Finland has a national core curriculum, and in addition to this and based on this all municipalities are obliged to compose their own local versions in accordance with the local situations. In the process of writing the core curriculum, many people have been involved – teachers, administrators, and educational experts of many kinds. The process lasts a couple of years. The work is led by the staff at the National Board of Education.

The curricula have a large general policy and aim section. This section describes the role of the local curriculum, the primary aim of basic education, the learning culture and working methods, assessment, cooperation with families and other stakeholders, pupils' welfare, optional studies, special support, and language topics (Finland has two national languages, Finnish and Swedish, and offers instruction in these languages, but also Roma, Sámi, and sign language). In this general part of the curriculum is also a section dealing with integrative instruction and multidisciplinary learning, and the aim of transversal competence. Transversal competence refers to knowledge, skills, values, attitudes, and will. Competences are described as "a precondition for personal growth, studying, work, and civic activity now and in the future" (p. 47, e-book). There are seven competence areas, including "Participation, involvement, and building a sustainable future" (T7 mentions democracy, active citizenship, personal relationship with nature, media impact, rules/agreements/trust, negotiation skills/arbitration/conflict resolutions, critical examinations, equality, sustainable way of living, reflecting on past/present/future, consequences of their own living and actions, as well as promote change and contribute to a sustainable future). The others are "Thinking and learning to learn" (T1), "Cultural competence" (T2), "Interaction and self-expression" (T3, relates strongly to social sustainability), "Multiliteracy" (T4, features of social sustainability), "ICT Competence" (T5, sustainable development is mentioned – "learn to assess the impact of ICT from the perspective of sust. dev. and to be responsible consumers"), and "Working life competences and entrepreneurship" (T6).

Chapters 13–16 deal with teaching and are divided by school subjects. These chapters include the tasks of the grades and the aims and contents of the various subjects.

The learning outcomes are defined in terms of the subjects and what pupils need for the grade 8 (scale: 4–10) in the specific subject in grade (school year) 6 and after finishing the courses in a subject in the grades 7–9.

3. Iceland: Structure and parts of curriculum framework

The present national curricula guide is from 2011. There are three different guides for preschools (2–5 years), compulsory schools (6–16 years), and upper secondary schools (16–19 years). Although very different, these all have the same six

fundamental pillars of education: (1) democracy and human rights, (2) sustainability, (3) equality, (4) creativity, (5) literacy, and (6) health and well-being. About these, the curriculum guide says:

- The fundamental pillars refer to social, cultural, environmental, and ecological literacy so that children and youth may develop mentally and physically, thrive in society, and cooperate with others. The fundamental pillars also refer to a vision of the future, ability and will to influence and be active in maintaining society, change it and develop.
- The fundamental pillars are based on the view appearing in school legislation that both social objectives and the educational objectives of the individual are to be achieved. They are socially oriented as they are to promote increased equality and democracy and to ensure well-educated and healthy citizens, both for participating in and for changing and improving society and also for contemporary employment.
- The fundamental pillars are meant to accentuate the principle of general education and encourage increased continuity in school activities as a whole. In evaluating school activities, the influence of the fundamental pillars on teaching, play, and studies has to be taken into consideration. The fundamental pillars are an intrinsic part of school activities.
- The concepts that the fundamental pillars are based on are to be reflected in the working methods, communication, and atmosphere of schools. They should be evident in all educational activities and in the content of school subjects and fields of study, both regarding the knowledge and the skills that children and youth are to acquire. Fields of study can be specialisation of the tasks of school activities, across subjects and school levels. (pp. 14–15)

The curriculum for the compulsory school level is divided into a general guide (pp. 7–82) and subjects guide (pp. 84–242). The general guide includes sections such as "Evaluation and supervision," "Study assessment in compulsory school," "Evaluation of compulsory school operations," and "Connection between home and school." The subjects guide begins with a section on "key competences" which are defined as "the type of competences that focus on the pupil and that are meant to enhance the pupil's general development. Key competences are integrated into all subject areas. They concern the pupils' competence for expression and communication, creative and critical thinking, independence and cooperation, use of media and information, and responsibility for and evaluation of their studies" (p. 86). This is followed by a section on the following subjects: Icelandic, Foreign languages, Arts and Crafts, Natural Sciences, Physical Education, Social Studies, Mathematics, and Information and Communication Technology (pp. 96–242).

Each subject section is divided into the following subsections: "Educational values and main objectives," "Competence criteria," "Teaching methods and assessments," and "Assessment criteria."

4. Norway: Structure and parts of curriculum framework

The curricula that are to be introduced in Norway incrementally from the 2020–2021 school year are known by the name LK20. The LK20 contains a core curriculum. The core curriculum applies to all subject curricula from grades 1–10 and describes the values and principles on which basic education should be based. The core curriculum has the status of regulations together with the rest of the curriculum.

Furthermore, the curriculum is divided into the following structure: "About the subject," the subject's relevance and central values, core elements, interdisciplinary topics, and basic skills; "Competence objectives and assessment;" and "Assessment scheme." Under "Competence objectives and assessment," there is a list of what students should be able to do after 2nd, 4th, 7th, and 10th grades. Here it is also described how the assessment should take place within each age division. Under "Assessment scheme," it is described which official scheme exists for assessment within the relevant subject.

There are no guidelines in the LK20 for how teachers should teach to achieve these goals.

Explanation from the Core Curriculum (*Overordnet del-verdier og prinsipper for grunnsopplæringen*):

"The **core curriculum** of the curriculum elaborates on the core values in the objectives clause in the Education Act and the overriding principles for primary and secondary education and training. It comprises this introduction, a summary of the objects clause and three chapters: 1. Core values of the education and training, 2. Principles for education and all-round development, and 3. Principles for the school's practice. The **subject curricula** describe the content and goals of the subjects. The core curriculum gives direction for the teaching and training in the subjects, and all the subjects contribute to realising the broad purpose of primary and secondary education and training. The curriculum in its entirety is the foundation for the teaching and training, where the different sections are closely linked and are to be used together."

The core curriculum sets the overall direction and foundation of the curriculum. The specific learning contents, objectives, and competency progressions are set in the subject curricula for each subject individually. The core curriculum also identifies the three "interdisciplinary themes" (i.e. sustainable development, public health and life skills, and citizenship and democracy) as overarching themes that should be addressed across all subjects.

5. Sweden: Structure and parts of curriculum framework

The curriculum for compulsory schools in Sweden has five main chapters. The first of these is "Fundamental Values and Tasks of the School." This chapter elaborates the mandate, goals, and ideals for the school and is framed in connection to the Education Act. The second chapter is "Overall Goals and Guidelines," which stipulates specific norms, values, and knowledge which all pupils should acquire through their education, and towards which teachers and employees should work. Knowledge outcomes are defined in terms of abilities, e.g. "can use, can communicate, can solve" as well as knowledge: – "has obtained knowledge about..." The curriculum also states that "[k]nowledge is a complex concept, which can be expressed in a variety of forms – as facts, understanding, skills, familiarity, and accumulated experience – all of which presuppose and interact with each other." After chapters on preschool and educare, Chapter 5 presents the syllabi for the individual subjects, of which there are twenty-one (Art, English, Home and Consumer Studies, Physical Education and Health, Mathematics, Modern Languages, Mother Tongue Tuition, Music, Biology, Physics, Chemistry, Geography, History, Religion, Civics, Sámi, Crafts, Swedish, Swedish as a Second Language, Sign Language, and Technology). Specific guidance is given for the teaching and progression in each subject. The core content is divided between grades 1–3, 4–6, and 7–9. Knowledge requirements for grades E-A are specified for the ends of grades 6 and 9.

5. Sustainability in teacher education

When implementing sustainability, teachers are in a key position, and teacher education is crucial (e.g. Angelotti et al., 2009; Leal Filho and Pace, 2016). However, even though educational policy and strategies include sustainability as a central concern, many teachers lack competency to handle the tricky and complex sustainability questions (Bürgener and Barth, 2018; Evans et al., 2017). They do not know how to deal with the controversies and uncertainties that underlie the field (Wolff et al., 2017), and find it challenging to promote sustainability values in an educational system that is plagued by non-sustainable values and practices (Hursh et al., 2015; Sterling, 2001).

In addition to looking at sustainability in educational policy in the Nordic countries, we also examine how sustainability is dealt with in teacher education. The examination is far from thorough and, because teacher education is so different in the five countries, we only present some main trends. Before discussing each country, it is worth outlining the main features of teacher education, such as the length of study, number of institutions providing general teacher education programmes, and the degree with which students graduate to become teachers.

Table 7: *An overview of main teacher education institutions, teacher education, and graduates each year*

Country	Number of inst.	Length of teacher ed.	Degree	Graduates each year
Denmark	4	4 years, 240 ECTS	Bachelor degree	1,800 ¹
Finland	8	5 years, 300 ECTS	M.Ed.	1,556 ²
Iceland	2	5 years, 300 ECTS	M.Ed./MA	80 ³
Norway	23	5 years, 300 ECTS	M.Ed.	1,695 ⁴
Sweden	28	3.5–5 years	Bachelor/M.Ed.	9,600 ⁵

1 Based on data from the Statistics Denmark (<https://www.dst.dk/en>) and taking into account the development since 2015 (KL, 2016).

2 This number includes all those who graduated with a Master in Education from the educational faculties in 2016 and also those who graduated in general education (Statistics Finland, 2019).

3 See Mennta og menningarmálaráðuneytið (2019). Since 2018, a program for recruiting more students into teacher education has resulted in more students entering teacher education both at the bachelor and the master levels, but it will take several years until the number of graduates increases.

4 Based on an average number of graduating primary and secondary school teachers during 2014–2016, from Teacher Education 2025: National strategy for quality and cooperation in teacher education (2015); Source: Database for Statistics on Higher Education, Norway.

5 Skolverket (2019). Lärarprognos 2019. Retrieved from: <https://www.skolverket.se/getFile?file=5394>. Number of years for all teacher education, not only basic teacher education.

As can be seen from Table 7, it is difficult to compare teacher education in these five countries. The situation is simplest in Iceland with only two institutions with general teacher education programmes. Denmark has also a fairly centralised system, with four institutions offering teacher education. Finland comes next with eight institutions offering teacher education programmes while in Norway and Sweden the institutions offering teacher education are more than twenty. Moreover, the size of the institutions likewise varies and the graduated students hold different university degree levels.

5.1 Sustainability in teacher education in Denmark

A study of the curriculum for the TE (BEK nr 186, 05/03/2018¹), does not reveal any explicit emphasis on sustainability in the primary subjects such as Mathematics and Danish, but a closer look into the secondary subjects shows that it is mentioned in one of the recent reforms of the Bachelor's Degree Programme in Education in March 2013 (Danish Ministry of Science, Innovation, and Higher Education, 2013). Here, sustainability is included as a learning objective for student teachers within a number of subjects. For example, the subjects Biology, Physics/Chemistry, Geography, and Nature Science all have the stated objective that students gain knowledge about action competence and sustainability in relation to mankind's interaction with nature and technology. Home Economics and Social Studies also include sustainability dimensions, while Woodwork and Needlecraft both have sustainability as one of four overall competence areas for prospective teachers.

The appearance of the term 'sustainability' seems rather vague. For example, in Biology it says that "[t]his is done with a broad general education approach to mankind's interaction with nature, the societal utilization of the natural basis, and sustainable principles for this." It is not further elaborated of what these sustainable principles consist. Another example is the competence goal for Geography:

This competence area deals with perspectives on natural science, the importance of science in society, historical and theoretical theory and in relation to sustainable and technological development.

One could argue that sustainability here is a normative perspective with or through which student can think. A final example could be in Culinary subjects:

Food awareness, sustainability, cooking, and food choices are about being able to make informed food choices in relation to food production conditions, season, taste, sustainability, application possibilities in cooking, and other quality parameters.

Here, sustainability is both included as a perspective within 'food awareness' and also referred to as a quality parameter that one can take into consideration as a consumer.

On a general level, however, whether we talk about sustainability or the UNSDGs, sustainability does not appear as a priority within TE. However, there are many smaller initiatives where there is a lot of goodwill in putting more emphasis on sustainability. For example, there is an initiative called Green Campus Group (*Grønt*

1. Bekendtgørelse om formål, kompetencemål, færdigheds- og vidensområder og opmærksomhedspunkter i børnehaveklassen (Fælles Mål): <https://www.retsinformation.dk/eli/ta/2018/186>

*Campus-gruppe*²⁾ where employees and students from KP are trying to bring their interest in this subject to life through collaborating on possibilities to put the sustainability theme on the national agenda.

On UC Lillebelt (another TE campus), a 10 ECTS course on Teaching for Sustainable Development (*Undervisning for Bæredygtig Udvikling*) is taught. The workgroup Green Campus is trying to implement this subject on several campuses – and also develop something for the kindergarten education. There is actually more emphasis on sustainability at the kindergarten level than there is on the primary education level.

It is worth mentioning that a lot of different materials have been produced about the UNSDGs which are based on teaching and which provide themes that connect the UNSDGs to each school subject.³ Though there is a wide range of approaches between how different schools and teachers implement them, teachers point out that the goals easily become something to check off, or they are only present on theme weeks/project weeks. In general, the field is dominated by private initiatives, NGOs, aficionados (*ildsjæle*), or grassroot initiatives. There is still a long way to go before it can be concluded that there is an implementation of sustainability in the TE on a national level in Denmark.

5.2 Sustainability in teacher education in Finland

Finnish teacher education has a long academic tradition by international standards, entering the universities in the 1970s. *The Act of Teacher Education* of 1971 located the education of primary school teachers in the university, first on a Bachelor's level. In 1987, the education finally became a Master's degree. Therefore, the first teachers with five years of training entered working life in the 1980s (Simola, 2015). Finland signed the Bologna Declaration in 1999 like many other European countries. The Declaration standardised higher education in Europe and made it more competitive on the world education market. Consequently, the development of quality assurance and evaluation became a standard at the Finnish universities. The language of the governmental expectation of higher education in Finland states:

The significance of higher education institutions is emphasised in a global operating environment. In addition to market position and capital, competition is increasingly based on an educated workforce and on research resources. Production of new knowledge and competence as well as their versatile utilisation will remain the basis of our success also in the future. (Finland Ministry of Education and Culture, 2009, p. 4)

Finnish teacher education has a worldwide reputation, since Finnish students have been on top in international comparisons, such as The Programme for International Student Assessment of OECD (PISA). The high quality of Finnish teacher education has contributed to this success (Sahlberg, 2011; Välijärvi et al., 2002). Nevertheless, Finland has not managed to include sustainability in teacher education. Universities

2. Grønt Campus-gruppe: <https://ucc.dk/aktuelt/nyheder/gront-flag-til-campus-carlsberg>
3. FN's Verdensmål for bæredygtig udvikling: <https://www.verdensmaalene.dk/undervisningeroevelser>
Breiting, Kaspersen og Kristensen, *Bæredygtighed og innovation i skole og læreruddannelse*: <https://astra.dk/sites/default/files/Innovation%20og%20bæredygtighed.pdf>
Grøn Skole: <https://groenskole.dk/andre-uddannelser>
Gør det bæredygtigt, VIA University College: <https://www.via.dk/om-via/baeredygtighed/naturfag-i-folkeskolen-skal-taenke-baeredygtigt>

are conservative and their teacher education has a strong subject orientation without enough interdisciplinary scientific understanding. The educational researchers and lecturers, therefore, include mostly specialists, even though sustainability issues are complex and request a strong interdisciplinary approach (Wolff et al., 2017; Wolff and Ehrström, 2020).

Of the sixteen Finnish universities, eight main universities provide teacher education in ten programmes. These universities are: The University of Eastern Finland; the University of Helsinki (programmes in two languages, Swedish and Finnish); the University of Lapland; the University of Jyväskylä; the University of Oulu; Tampere University; the University of Turku (with teacher education programmes in Turku and Rauma); and Åbo Akademi University. Finnish primary teacher education leads to a higher academic degree (300 ECTS) with education as the major subject. This Master's degree certifies graduates to teach grades 1–6. Primary school teachers are also qualified to teach grades 7–9 if they take further studies in one or more school subjects.

The Finnish teacher education is research-based. In the learning process, theory and practice appear alternately aiming at educational experts with a readiness for professional development throughout their careers. The independent writing of a Master's thesis, together with studies in educational research methodology, are an important start of this learning process. However, the high-level teacher education is not obvious when it comes to sustainability (see Wolff et al., 2017). Since Finnish primary teacher education prepares the student teachers to teach primary school subjects, most of their studies consist of compulsory courses. Therefore, students generally choose their minors among the subjects of the primary school curricula. According to the core curricula of 2004 and 2014, sustainability should be implemented in all subjects. This is a challenge that has not only been a problem in schools, but also in teacher education.

Not only the Finnish curricula but also many other policy documents, especially educational strategies on sustainable development, have highlighted the role of teachers. The implementation of sustainability in teacher education is actually better addressed in political rhetoric than in reality. Evaluations on the success of the suggested implementation are rare, and those that are available do not show any optimistic view.

The teacher educators at the universities can independently decide how to implement the topic of sustainability in the teacher education programmes. In a study from 2010, Maria Hofman found that none of the Finnish universities offering teacher education had compulsory courses on sustainability for all at basic levels. Her website analysis also showed that the number of courses on sustainability differed between higher education institutions in Finland. In addition, her study revealed that a majority of the teacher educators (87%) had not received any training or education in how to integrate sustainability into all subjects. In addition, more than half of the respondents were unaware if their department had defined the concept of sustainable development in their strategies or other policy documents.

In a study from 2013 including various categories of teachers (also vocational teachers), Alina Pathan, Marika Bröckl, Laura Oja, Sanna Ahvenharju and Tuomas Raivio found no answer on how higher education could guarantee that student teachers are prepared to teach sustainability. The investigation, organised by the

educational division of the Finnish Commission on Sustainable Development, aimed at all the educational organizations appointed as responsible for the implementation of sustainable development, such as higher education institutions offering teacher training, regional governmental agencies, and NGOs. The results showed that the promotion of sustainability in higher education to a high degree was dependent on enthusiastic key persons. Many of the respondents (administrators and governmental staff, n=45) also hoped for stronger steering by the Ministry of Education and Culture (at that time called the Ministry of Education).

Emelie Cockerell has studied how sustainability is implemented at the eight Finnish universities offering teacher education in the academic year 2019–2020. She investigated each university's teacher education introduction and strategy. She specifically noted each time the words 'sustainable development' or 'sustainability' occurred in any of the three languages (Finnish, Swedish, or English). In addition, she thoroughly studied every course in each of the ten separate teacher education branches, both Bachelor's degree courses and Master's degree courses. This resulted in a corpus made up of 860 course descriptions, which she systematically read and recorded on their mention of the terms 'sustainability' or 'sustainable development' or where they indicated the notion of sustainable development by other means.

Cockerell's study revealed that sustainability is variously apparent in the Finnish university strategies in use for 2019–2020, from non-existent or only brief mention to a strong emphasis. According to her findings, even a strong emphasis in the strategy was not always similarly obvious in the general teacher department programmes. Only one university mentioned sustainability in its teacher education programme description. Cockerell's study also revealed that sustainability is seldom a compulsory part of the teacher education courses. In fact, sustainability is mainly offered as optional courses. The University of Helsinki's Swedish branch and the University of Lapland each offer four compulsory Bachelor courses. This is the largest number, according to Cockerell's study. In addition, all universities, except two, lack compulsory courses in sustainability at the Master's degree level. The University of Lapland and the University of Eastern Finland each offer one compulsory Master's course, and that is more than the other universities do. Åbo Akademi and the University of Lapland offer the most courses with a focus on sustainability, with fourteen courses, though most of them are elective.

Cockerell's study shows that there is a significant lack of courses targeting sustainability in higher education institutions in Finland. Her study also revealed that all the university strategies, teacher education descriptions, and teacher education courses did not mention the terms 'sustainable development' or 'sustainability.' Therefore, the universities cannot work towards a consistent goal of sustainability in their teacher education. This demands a consequent approach from strategies, through teacher education programmes to course descriptions and contents. It also will demand regular evaluations of the results. How sustainability is addressed definitely needs to become a part of the university quality assessments.

Higher education in Finland, like in other countries in Europe, strives to be competitive, and sustainability has to match many, often even strongly contradicting goals (Uljen, Wolff, and Frontini, 2016). In addition, higher education institutions involve diverse stakeholders, from funding agencies, politicians, and managers to office staff, lecturers, and students. The reason for the slow implementation of sustainability in higher education is due to, among other things, the competition

between divergent goals, the complexity of sustainability issues, and the epistemological differences between the disciplines (Wolff and Ehrström, 2020). Yet, a very positive notion is that in the policy declaration of the Ministry of Education and Culture (2020), the Ministry not only underlines the integration of sustainable development perspectives in early childhood education and school education. It also "stresses the importance of addressing the sustainable development perspectives in teacher education and supports the strengthening of sustainable development in in-service training of teachers" (p. 9). At the same time, there is a bottom-up approach occurring. The Teacher Student Union of Finland (SOOL, 2020a) stresses among its goals for teacher education that sustainable development needs to be integrated in the teacher education, highlighting teachers as sustainable lifestyle role models. In 2019, SOOL's general assembly demanded an integration of climate change education in the educational programmes at the teacher education universities and polytechnics (offering vocational teacher education), and they challenged them to include climate change and sustainability education in their study programmes (SOOL, 2019). The reply was promising; the nine higher education institutions that participated promised to improve their sustainability education (SOOL, 2020b). SOOL is not, however, willing to wait on actions to come:

As future teachers, we have the opportunity to change the world and increase climate awareness. According to climate education, we need teacher training in our curricula so that we can guarantee our learners the skills to build the future. The time for change is now. (Sanna Salmenoja in SOOL, 2019, authors' translation)

5.3 Sustainability in teacher education in Iceland

In 2008, teacher education in Iceland changed from a three-year B.Ed. degree to a five-year Master's degree (300 ECTS MA or M.Ed.). To become a licensed teacher before 2008, most students enrolled in one of a few three-year programmes (at the Iceland University of Education, which later became the School of Education at the University of Iceland, or at the University of Akureyri) from which they graduated with a B.Ed. degree. With the change to a five-year Master's degree, students could meet the required criteria either by taking a five-year teacher education at the School of Education (B.Ed.+M.Ed. in various programmes) or by first completing a Bachelor's degree (BA or BS) and then completing a two-year Master's programme designed for those not having previous teacher education. The current law on teacher education is from 2019 (95/2019). According to it, to be qualified as a teacher, a student must complete a Master's degree and have both general competence (such as competence to create motivating learning environment and evaluate the progress of students) and specific competence which consists of having completed at least 90 ECTS in a specific school subject.

To acquire a picture of how well sustainability is dealt with in teacher education, we looked at the course catalogue for the academic year 2019–2020 at the School of Education at the University of Iceland for two faculties: Faculty of Education and Pedagogy and Faculty of Subject Teacher Education, and the teacher education programmes at the University of Akureyri. The vast majority of teachers come from these two institutions and at the School of Education most of those studying to become teachers are enrolled in the two above mentioned faculties.

The programme at the University of Akureyri barely mentions sustainability: it is not mentioned in the overall programme description, and within the B.Ed. part of the programme the term "sustainability" figures in the descriptions and learning outcomes of only two courses while "environmental education" is mentioned in the description of the one course that focuses specifically on sustainability and environmental education. The fundamental pillars of education (a concept defined in the 2011 national curricula, one of which is "sustainability") are mentioned in the learning outcomes or course descriptions of five courses. At the M.Ed. level, the same concepts are not mentioned.

At the School of Education, UI, Faculty of Education and Pedagogy and Faculty of Subject Teacher Education offer eight programmes at the Bachelor's level from which students graduate with a B.Ed. degree focusing on the elementary school level. Of those programmes, only one – Natural Science Teaching in Compulsory School – mentions 'sustainability' in the programme description or its learning outcomes (four times). Four programmes include at least one course where the word 'sustainability' occurs in the course description.

Within the Faculty of Education and Pedagogy and the Faculty of Subject Teacher Education, eighteen programmes at the Master's level focus on work at the compulsory school level. Not all of those are directly focusing on students becoming classroom teachers but are concerned more with leadership, mentoring, or the role of support teachers or special education. A special course on sustainability and education called "Education for Sustainability – Skills in a Changing World" is a required subject in most of these programmes.

Sustainability is rarely mentioned in the descriptions or the learning outcomes of the various programmes leading to a teacher certificate. The same goes for the different courses in the catalogue; only around 5% of them mention sustainability explicitly. But on the other hand, most students who complete one of the five-year programmes towards becoming a teacher are required to take the course "Education for Sustainability – Skills in a Changing World," which not only deals with sustainability as a subject matter but also as a pedagogical approach – what Sterling would refer to as sustainable education.

Another noteworthy aspect of the course catalogue is its reference to the six pillars of education defined in the 2011 National Curriculum Guide: (1) democracy and human rights, (2) sustainability, (3) equality, (4) creativity, (5) literacy, and (6) health and well-being. All of the pillars are relevant for sustainability, as is evident from the way they are presented in the National Curriculum Guide.

The fundamental pillars refer to social, cultural, environmental, and ecological literacy so that children and youth may develop mentally and physically, thrive in society, and cooperate with others. The fundamental pillars also refer to a vision of the future, ability and will to influence and be active in maintaining society, change it and develop. (Ministry of Education and Science, 2012, p. 14)

These pillars are often mentioned in the descriptions of courses in teacher education at the School of Education. Sometimes they are referred to collectively while in other cases specific pillars are mentioned. The fundamental pillars are mentioned in the descriptions of at least thirteen courses and ten programmes in the two faculties. This indicates that the National Curriculum Guide influences not only teaching in compulsory schools directly but also indirectly through the design of teacher

education.

No large-scale study has been conducted to evaluate students' views on how well-prepared they are to teach about sustainability and towards sustainability when they have completed their studies. However, when a focus group of students in their fourth and fifth years was asked about sustainability education in the teacher education programmes at the School of Education, one student responded:

The teaching itself is not so much about what sustainability is but more about sustainability as a way of thinking and how we can use the possibilities in your immediate environment in teaching. (Gunnarsdóttir and Árnadóttir, 2020, p. 52)

The focus group also commented on the course selection saying:

There are many courses on offer in the programme that deal in one way or another with sustainability, especially elective courses which focus on climate change and education, natural science learning in the 21st century, environmental studies, and more. (Gunnarsdóttir and Árnadóttir, 2020, p. 52)

Both positive and negative things appear when reading the course catalogue of the School of Education with sustainability in mind. The voices in the focus group reflect this mixed message when they say that they feel competent about teaching the UNSDGs but that their preparation is in part due to their own personal interests and efforts.

5.4 Sustainability in teacher education in Norway

Teacher education in Norway has gone through a series of reforms over the past ten years. The main reforms have aimed at improving the overall quality of teacher education – extending the required basis for teacher education to a five-year Master's programme, strengthening the pedagogical links between theory and practice in teacher education, and harmonising with the general trend in higher education in Norway towards institutional mergers to achieve enhanced academic environments and gain greater research expertise. The reforms to teacher education were partially stimulated by what is known as the "PISA shock" that occurred in Norway at the beginning of the 21st century when it was found that Norwegian students were performing below the average level in international student assessment tests (especially compared to the other OECD countries tested under the PISA programme).

Policymakers and educators began to respond to the needs to improve teaching quality, increase recruitment into teacher education, and strengthen the professional status of teachers through a series of discussions and commissions looking into the need for reforms in teacher education. Additionally, substantial investments have been made into teacher education programmes and in educational research. In 2009, the Ministry of Education and Research submitted a white paper to the government – Report to the Storting, No. 11 (2008–2009), *the Teacher, the Role, and the Education* – and this was followed up the same year with the establishment of the National Curriculum Committee to develop and propose regulations for a national curriculum for the newly differentiated teacher education programmes for primary and lower secondary education (i.e. grades 1–10) in Norway. The new

National Guidelines for Differentiated Primary and Lower Secondary Teacher Education Programmes for Years 1–7 and Years 5–10: General Provisions⁴ were published in early 2010 and came into effect in the autumn of the same year. “The Regulations are designed to help ensure a unified national structure in the teacher education programmes for primary and lower secondary education, without giving all the details” (2010, p. 2). While these guidelines aim to ensure nationally that teacher education responds to a consistent level for quality requirements, autonomy is still granted to the individual teacher education institutions. It is up to each institution to prepare their own programme descriptions clarifying the academic content, teaching practice, working methods, and assessment process in compliance with the regulations and guidelines, and these must be approved by the Board of each institution. The most distinctive change with these regulations is the differentiation of the guidelines for teacher education into two distinct levels of teaching for primary and lower secondary education.

This reform was followed by a new strategy – The Teacher Promise: Team for the Knowledge School published in 2014.⁵ This strategy introduced the plans for major reforms in teacher education, the basis of which is the establishment of a five-year minimum education for teacher qualification. It also laid out requirements for greater subject-based specialisation for all teachers, as well as establishing stronger requirements for continuing professional development of teachers and school-based development initiatives to support this. The strategy also increased the requirement standards for acceptance into teacher education programmes. As a follow-up to this strategy, a committee was formed to develop the new framework plan for five-year basic teacher education (*rammeplan for femårige grunnskolelærerutdanninger*). The circular for this framework plan was published in July 2016 with the guidance/regulations that teacher education institutions were required to initiate a new model of five-year Master's programmes in teacher education as the basic qualification requirement for teachers for autumn 2017.⁶

While the transition to a higher standard of basic qualification for teacher education is welcomed by teacher education institutions, there have also been challenges. In particular, while the basic standards of qualification increased from a four-year Bachelor's to a five-year Master's programme of study, Norway already had a high number of teachers pursuing an additional two-year Master's programme in addition to the four-year Bachelor's programme. For many teacher education institutions, they have faced difficulties in condensing the full contents of the previous Bachelor's plus Master's model which brought six years of instruction into the new combined 5-year Master's of teacher education (i.e. in effect, providing 3.5 years of Bachelor-level instruction and 1.5 years Master-level instruction). In addition, while these two systems harmonise, there continues to be a need to offer stand-alone Master's programmes for those who completed basic qualifications under the previous system. There are also additional requirements for upscaling the level of current qualifications for in-service teachers to match these new standards. This mix of requirements places additional pressure on the overall teaching capacity and staffing at teacher education institutions.

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4. National Guidelines for Differentiated Primary and Lower Secondary Teacher Education Programmes (2010): https://www.regjeringen.no/globalassets/upload/kd/vedlegg/uh/forskrifter/guidelines_differentiated_teacher_education.pdf
 5. Only available in Norwegian: Lærerløftet - På lag for kunnskapsskolen (2014): https://www.regjeringen.no/globalassets/upload/kd/vedlegg/planer/kd_strategiskole_web.pdf
 6. Rundskriv F-06-16 Forskrifter om rammeplaner for femårige grunnskolelærerutdanninger for trinn 1-7 og trinn 5-10. <https://www.regjeringen.no/no/dokumenter/f-06-16/id2507752>

In June 2017, a subsequent strategy, Teacher Education 2025: National Strategy for Quality and Cooperation in Teacher Education,⁷ was published, providing more strategic guidance on the implementation of the reform measures mandated in the framework plan. The strategy has four overall goals:

- academically challenging and rewarding study programmes;
- academically strong and well-organised teacher education providers;
- knowledge-based and involved partners in the kindergarten and school sectors;
- stable and mutually beneficial cooperation between teacher education institutions, the kindergarten sector, and the school sector (2018, pp. 7–8).

Beside the transition to the five-year Master's programme for basic teacher education, this strategy also sets out guidelines for strengthened collaboration between schools and teacher education, as well as striving for a greater research-based and evidence-directed approach to teacher education. In addition, the strategy sets target guidelines for the professional standards of academic staff teaching in these new five-year Master's programmes (e.g. at least 10% must be professors or readers, and at least 40% must be qualified for the position of associate professor or senior lecturer) (2018, p. 17).

Teacher Education 2025: National Strategy for Quality and Cooperation in Teacher Education states that:

The impact of teacher education on the teaching professions has been highlighted in several policy documents, in particular in the strategy Promotion of the Status and Quality of Teachers. The government has addressed the major challenges in this area through improvement of the institutional structure, elevation of primary and lower secondary teacher education (GLU) to the Master's level, large investments in a robust national system for continuing education, introduction of more rigorous entry requirements for teacher education programmes for both the primary and the secondary level, as well as the requirement, effective from 2019, that candidates for the one-year programme in educational theory and practice (PPU) must hold a Master's degree. (2018, p. 5)

Corresponding to these system-wide reforms, strategies have also been put in place for the enhancement of programmes for kindergarten teacher education (although this is not reviewed here).

The Teacher Education 2025 strategy sets out several targets for achieving academically challenging and rewarding study programmes for teacher education:

- well-qualified and motivated applicants;
- improved gender balance among the students;
- a diverse student population that better reflects outside society;
- less detailed national curriculum regulations than is currently the case;
- teaching based on high-quality research which is relevant to the teaching profession;

7. Norwegian version: Lærerutdanningene 2025. Nasjonal strategi for kvalitet og samarbeid i lærerutdanningene (2017): <https://www.regjeringen.no/no/dokumenter/nasjonal-strategi-for-larerutdanningene/id2555622/>
English version: Teacher Education 2025: National Strategy for Quality and Cooperation in Teacher Education (2018): <https://www.regjeringen.no/en/dokumenter/larerutdanningene-2025.-nasjonal-strategi-for-kvalitet-og-samarbeid-i-larerutdanningene/id2555622/>

- teaching methods that involve the students actively in the learning process;
- experience-based and research-based practice training as an equally important part of the study programme;
- and professional orientation and coordination between the different elements of the study programme. (2018, p. 7)

It also provides details on how teacher education should respond to the new model for competency development in schools and for the new ICT strategy for strengthened digitalisation in learning and use of educational technologies.

With the aforementioned reforms, the standard of teacher education in Norway has two clearly defined and differentiated programmes for primary (MGLU 1–7) and lower secondary (MGLU 5–10) teacher education, each with separate regulations. Both programmes consist of five years of education for which a Master's degree is awarded. The programmes consist of both compulsory courses and elective courses. For the first three years of the programme, students take school subjects with a scope of 30 + 30 credits (i.e. 60 credits in total at the first-cycle level) and 30 credits in pedagogy and pupil-related skills. In addition, students take subjects relevant to work in schools (i.e. profession-oriented pedagogy and special pedagogy with a scope of 30 credits). In the fourth and fifth years of the programmes, students have courses in pedagogy and pupil-related skills with a scope of 30 credits and master subject with a scope of 90 credits at the second-cycle level. Students also choose either profession-oriented pedagogy or special pedagogy as master subjects. The main changes based on this strategy are the professional requirements for teacher training with the foundation being a five-year minimum standard for teachers in basic education (grades 1–10).

While sustainable development is identified as a general competence and featured in the learning outcomes set for some subjects, it is not heavily integrated into the framework and guidelines for teacher education. Sustainable development is mentioned only once in the two framework plans (*Forskrift for rammeplaner trinn 1–5 og trinn 5–10*). It is in the first competence aim with the headline "general competence." The earlier 2010 version of the framework plan (*FOR-2010-03-01-295*) also mentioned sustainable development once, but as part of the Skills section: "the candidate [will] have a good understanding of global issues and sustainable development."

'Sustainable development' is mentioned twelve times in both the national guidelines, and in the same way in the two documents. The guidelines state that teacher education should provide research-based knowledge about the climate, environment, and development, and competence that supports pupils' learning about, attitudes to, and actions for sustainable development. Sustainable development is also mentioned in learning outcomes for the second cycle of teaching practice. Moreover, sustainable development is mentioned in the guidelines for the subjects Food and Health, Natural Science and Social Studies – most frequently in Natural Science. The guidelines however do state a need for the teacher education curriculum to align with and provide relevance for the national curriculum for basic education. Thus, with the recent curriculum renewal in Norway being implemented from autumn 2020, many teacher education institutions are already taking efforts to integrate the interdisciplinary themes (*tverrfaglig temaer*) into their teacher education programmes, plans, and progression steps.

5.5 Sustainability in teacher education in Sweden

As of 2011, teacher education for the compulsory school in Sweden is divided into three main programmes: Primary teacher for preschool and years 1–3 (*Grundlärare F–3*), Primary teacher for years 4–6 (*Grundlärare 4–6*), and Subject teacher for years 7–9 (*Ämneslärare 7–9*). Each of these is a four-year programme and equates to 240 ECTS. Upon completion of a teacher education programme, students receive both a general (academic) degree within the subject area and a professional degree within the teaching profession (Swedish Council for Higher Education, 2019). The Swedish government describes four overall perspectives which should permeate all teacher education: (1) a scientific and critical approach, (2) a historical perspective, (3) an international perspective, and (4) ICT. These perspectives are intended to mitigate normative attitudes, allow students to evaluate different educational methods and theories, broaden students' spatial and temporal knowledge, and adapt them to digitalisation (The Ministry of Education, 2008).

These four perspectives resonate well with various aspects of the UNSDGs in general, and with Goal 4.7 in particular. Thus, the critical and international perspectives relate directly to "promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity." Thus, even if sustainability is not mentioned explicitly, these four perspectives can be viewed as broadly framing an orientation towards ESD within teacher education in Sweden.

Within the study plans for the primary teacher programmes at the universities of Uppsala, Stockholm, and Gothenburg, the goals outlined for the programmes all include the statement that students should "demonstrate the ability to make judgments within educational work on the basis of relevant scientific, social, and ethical aspects with special regard to human rights, in particular the rights of the child under the Convention, and sustainable development" (Uppsala University, 2016; Stockholm University, 2017; Gothenburg University, 2019b). This quote is taken directly from the Higher Education Act, from the section on evaluation ability for primary teachers (The Swedish Government, 2019). Thus, in line with national educational policy, each of these universities explicitly includes as an overall goal of their teacher education programmes an ability to make judgments in terms of sustainable development.

In terms of specific courses dealing with sustainability, clear differences are evident among these different teacher education programmes. In the subject teacher programme at Gothenburg University, all students are required to take a multidisciplinary course on sustainable development and human rights which is run in collaboration with two museums and other cultural institutions (Gothenburg University, 2019a). At Uppsala University, the compulsory school teacher education programmes offer a 7.5 ECTS course called 'Evaluation and sustainable development work' (Uppsala University, 2020). Stockholm University, on the other hand, does not include any courses explicitly dealing with sustainability in its compulsory school teacher education programmes.

6. Summary and thematic tables

In this chapter, we present some of the main findings in a more schematic way in two kinds of tables. First come two tables presenting how the curricula in each of the Nordic countries define sustainability (Table 8) and which key terms seem important to sustainability within the curriculum framework (Table 9). These tables might help the reader to receive an overview, but for a more thorough discussion, one has to go to the previous chapters. In the next subsection, we provide thematic comparisons in five tables. Again, the tables may help the reader to get an overview of a highly complex field by drawing out similarities and differences between the Nordic countries although they leave out all details of interpretation.

6.1 Summary tables

Table 8: *Definitions of sustainable development and education for sustainable development in the national curriculum in each of the Nordic countries*

Country	Definition of Sustainable Development
Denmark	No specific definitions of sustainable development, sustainability, or ESD are presented in the curriculum.
Finland	The Finnish curriculum only presents sustainability in relation to ecosocial knowledge. Necessity of a sustainable way of living (p. 36, e-book): "Humans are part of nature and completely dependent on the vitality of ecosystems. Understanding this plays a key role in growth as a human being. Basic education acknowledges the necessity of sustainable development and ecosocial knowledge and ability, follows their principles, and guides the pupils in adopting a sustainable way of living. Sustainable development and ways of living comprise an ecological and economic dimension as well as a social and cultural dimension. The leading idea of ecosocial knowledge and ability is creating ways of living and a culture that foster the inviolability of human dignity and the diversity and ability for renewal of ecosystems while building a competence base for a circular economy underpinned by sustainable use of natural resources. Ecosocial knowledge and ability means that the pupils understand the seriousness of climate change, in particular, and strive for sustainability. The way humans develop and use technology and make decisions about technology is based on their values. They have a responsibility to steer technology in a direction that safeguards the future of humans and their environment. In basic education, the pupils examine the conflicting aspects of our modes of consumption and production in terms of a sustainable future, and seek jointly to put into practice solutions that improve our way of living over the long term. The pupils are also familiarised with social structures and solutions that impact on the development and guided in exerting influence on them. Basic education broadens the pupils' horizons, allowing them to appreciate their cross-generational global responsibility." (This quotation is from a text called 2.2 Underlying values of basic education. It has three paragraphs: Uniqueness of each pupil and right to a good education; Humanity, general knowledge and ability, equality and democracy; and Cultural diversity as a richness and necessity of a sustainable way of living.)

Country	Definition of Sustainable Development
Iceland	Sustainability as a fundamental pillar of education is defined and discussed on one and a half pages. The discussion begins with the following definition: "Education towards sustainability aims at making people able to deal with problems that concern the interaction of the environment, social factors, and the economy in the development of society. The most common understanding of the concepts sustainability and sustainable development involves that we leave the environment to our descendants in no worse condition that we received it, and that we endeavour to meet the needs of the present without reducing the possibilities of future generations to meet theirs. This also refers to the definition of sustainability – that it is a balanced situation and that sustainable development is the process of change when society, or a smaller unit, is developing towards sustainability. The difference between the traditional definition and the definition used here is a difference in emphasis rather than in meaning. This difference in emphasis is, however, important in educational work as it stresses that little things mean a lot, and that it is not necessary to wait for big changes to be able to rejoice in the smaller." (p. 18)
Norway	'Sustainable development' is defined in Part 2.5.3: "Sustainable development is about safeguarding life on earth and meeting the needs of the present, without compromising the ability of future generations to meet their own needs." 'Education for sustainable development' is not mentioned directly. The Core Curriculum explains the interdisciplinary themes and sustainable development in the following way: "2.5 Interdisciplinary topics: School shall facilitate for learning in the three interdisciplinary topics health and life skills, democracy and citizenship, and sustainable development. These three interdisciplinary topics in the curriculum are based on prevailing societal challenges which demand engagement and effort from individuals and local communities, nationally and globally. The pupils develop competence in connection with the interdisciplinary topics by working with issues from various subjects. They shall gain insight into challenges and dilemmas in these topics. Pupils must understand where they can find solutions through knowledge and collaboration, and they must learn about the relationship between actions and consequences. The knowledge base for finding solutions to problems can be found in many subjects, and the topics must help the pupils to achieve understanding and to see connections across subjects. The goals for what the pupils should learn in the topics are stated in the competence goals for the individual subjects where this is relevant." "2.5.3 Sustainable development: Sustainable development as an interdisciplinary topic in school shall help the pupils to understand basic dilemmas and developments in society, and how they can be dealt with. Sustainable development refers to protecting life on earth and providing for the needs of people who live here now without destroying the possibilities for future generations to fill their needs. Sustainable development is based on the understanding that social, economic, and environmental conditions are interconnected. Our lifestyles and resource consumption have local, regional, and global consequences. In working with this topic, the pupils shall develop competence which enables them to make responsible choices and to act ethically and with environmental awareness. The pupils must learn to understand that all individual activities and choices are significant. This topic includes issues relating to the environment and climate, poverty and distribution of resources, conflicts, health, equality, demographics, and education. The pupils shall learn about the different aspects of sustainable development. Technology has substantial impact on human beings, the environment, and society. Technological competence and knowledge about the links between technology and the social, economic, and environmental aspects of sustainable development are thus key discussion points here. While technological development may help to solve problems, it may also create new ones. Knowledge about technology implies understanding which dilemmas may arise due to the use of technology, and how these can be dealt with."
Sweden	No specific definitions of sustainable development, sustainability, or ESD are presented in the curriculum.

Table 9: *Within the context of the curriculum framework, are there important concepts or key words that must be considered/reviewed in line with sustainable development and/or education for sustainable development?*

Country	Important Concepts and Key Words
Denmark	Lifelong learning – making sure that each student gets as “good” as they can. One could argue that the overall goal for education in Denmark has shifted from putting social equality as the main goal with the education to now become more profit-oriented. Participation is now more focused on participation in the workforce than participation as a democratic citizen. In The Law of Primary Education, Chapter one, there are some elements that can be argued as indirectly in connection to sustainable development. §1. In collaboration with the parents, the public school must provide students with knowledge and skills that: prepare them for further education and make them want to learn more, familiarise themselves with Danish culture and history, give them an understanding of other countries and cultures, contribute to their understanding of human interaction with nature, and promote the individual student’s versatile development. (Our translation) §2. The elementary school must develop working methods and create a framework for experience, depth, and real life, so that the students develop awareness and imagination and gain confidence in their own opportunities and background to take a stand and act. (Our translation) §3. The public school must prepare students for participation, co-responsibility, rights, and duties in a society of freedom and government. The school’s work must therefore be characterized by a freedom of spirit, equality, and democracy. (Our translation)
Finland	The word sustainable occurs nearly 200 times in the core curriculum of 2014, mostly followed by the words ‘development’, ‘lifestyle’ and ‘future’. The curriculum includes many other concepts related to sustainability. These concepts occur repeatedly and many of them are also mentioned among the core aims of basic education. Common concepts in the entire curriculum are ‘nature’, ‘democracy’, ‘inclusion’, ‘participation’, ‘human rights’, ‘identity’, ‘equity’, and ‘equality’. Other usual concepts that can be both in line with or contradictory to sustainability are ‘change’, ‘working life’ and ‘competences’. A word that occurs in many paragraphs and sentences is ‘future’. Concepts related to methods are ‘multidisciplinary learning’ and ‘transversal competences’. “Basic education offers the pupils possibilities for versatile development of their competence. It reinforces the pupils’ positive identity as human beings, learners and community members. Education promotes participation, a sustainable way of living and growth as a member of a democratic society. Basic education educates the pupils to know, respect and defend human rights. The social task of basic education is to promote equity, equality and justice.” (e-book, p. 41-42)
Iceland	‘Sustainability’ and ‘education for sustainability’ are explicitly linked to the other five pillars of education. In a subsection titled ‘Relations and nature of the fundamental pillars,’ the following is stated: “Sustainability concerns the interplay of the environment, economy, society, and welfare. Sustainability includes respect for the environment, sense of responsibility, health, democratic working methods, and justice, not only at the present time but also for future generations. Therefore, it is unthinkable to support human rights without simultaneously espousing sustainability and balanced social development. Additionally, sustainability is dependent on the equality of social groups, democracy, and human rights. Health and welfare are thus an integral part of sustainability and, at the same time, independent fundamental pillars of education. Education towards sustainability, equality, democracy, and human rights therefore aim at children and youth understanding society as it is and has developed. At the same time, education aims at enabling children and youth to participate in forming society and thus acquiring a vision of the future and ideals to advocate the concepts of education towards sustainability, education towards democracy and human rights, and education towards equality. They do not necessarily aim at developing new subjects or fields of study; they are rather used to pointing out educational material and attitudes that are to be emphasised” (p. 16).

Country	Important Concepts and Key Words
Norway	Sustainable development is classified as one of three interdisciplinary themes to be addressed across the curriculum. The other two are 'citizenship and democracy' and 'public health and life skills.' These three themes aim to enable learners with the capacities to apply their learning to address complex social challenges of the 21st century. As such, these themes also connect closely with the idea of 'social forming' (dannelse), which is a key perspective of the curriculum, and through this connect with developing appreciation of the natural and cultural heritages of the country. There is also close connection with the six core values of the curriculum: Human dignity; Identity and cultural diversity; Critical thinking and ethical awareness; The joy of creating, engagement, and the urge to explore; Respect for nature and environmental awareness; and Democracy and participation.
Sweden	In Chapter 1, 'Fundamental Values and Tasks of the School', four perspectives are described with which schools are to provide pupils; these are: historical, environmental, international, and ethical. These perspectives include qualities such as "an understanding of the present, and a prepared-ness for the future, ... ability to think in dynamic terms," "to take responsibility for the environment in areas where they themselves can exercise direct influence," "to form a personal position with respect to overarching and global environmental issues," to "understand one's own reality in a global context and to create international solidarity," as well as the "ability to form personal standpoints and to act responsibly towards themselves and others." Thus, these perspectives cover many key concepts in relation to ESD, and can be seen as framing the curriculum's orientation towards sustainable development. Moreover, throughout the curriculum, concepts such as gender equality, democratic values and human rights, equality and non-discrimination, and critical thinking are emphasised, all of which can be related to sustainable development / ESD.

6.2 Thematic comparison tables

In the following tables, thematic comparisons among the five Nordic countries are given. The tables show some striking similarities but also differences. However, the tables focus on the national curricula and the reader should be mindful, when interpreting the tables, that the national curricula differ greatly from one country to another.

To indicate whether and to what extent a theme is included in the curricula, we use the following legend:

- + += exists with explicit links to sustainability education in curriculum;
- + = exists, but only implicit links to sustainability education in curriculum;
- = exists, but no links to sustainability education in curriculum;
- X = does not exist (or at least was not identified in the curriculum review).

The tables cover themes that are explicitly related to sustainability education, such issues related to the definition of the concept (Table 10), integration of sustainability in other subjects, (Table 11), different pedagogical practices (Table 12), school culture and school management (Table 13) and, finally, issues related to assessment (Table 14).

Table 10: *Thematic coverage of sustainable development within the curriculum frameworks*

	Denmark	Finland	Iceland	Norway	Sweden
Inclusion of UNSDGs	X	+	X	+	X
Coverage of three dimensions (social, environmental, and economic)	O (environment dimension is weakest)	++	++	++	O (+ for environment dimension)
Diversity of geographical coverage in relation to sustainable development	+	+	++	++	+
Coverage of sustainability knowledge aspects	++	++	++	++	++
Coverage of sustainability competences and skills	O	++	++	++	+
Coverage of sustainability values and attitudes	X	++	++	++	+

Table 11: *Integration approaches for sustainable development in the curriculum framework*

	Denmark	Finland	Iceland	Norway	Sweden
Interdisciplinary / transdisciplinary approaches	+	++	++	++	+
Whole-school / whole-system approaches	X	++	+	X (guidance about learning environment / culture is given)	X (guidance about learning environment / culture is given)
Sustainability themes / topics incorporated into traditional subjects	+	++	++	++	++
Decentralised curriculum, teaching adapted to local contexts and linked to real-world issues	++	++	++	++	++

Table 12: *Learning methods and perspectives (pedagogical practice)*

	Denmark	Finland	Iceland	Norway	Sweden
Student-centred and active learning approach	++	++	O	+	+
Problem-solving and solutions orientation to learning	++	+	O	++	+
Learning approach encourages real-world actions and promotes behaviour change	++	++	O	++	++
Citizenship education, social responsibilities, and education's role in social learning	++	++	++	+	++

Table 13: *School culture and school management*

	Denmark	Finland	Iceland	Norway	Sweden
Guidelines given on "school culture," "learning environment," and/or "culture for learning"	O	++	O	+	O
Student participation in school governance, decision-making, and management	O	++	O	+	O
Guidelines on relationships between schools and the wider community	O	++	O	X	O

Table 14: *School culture and school management*

	Denmark	Finland	Iceland	Norway	Sweden
Learning objectives and/or competency goals defined in a progressive (or scaffolded) manner	O	+	++	++	O
Specific guidelines for assessment of sustainability learning aspects	O	++	++	+	O

7. Sustainability in the Nordic countries: Similarities and differences

The project is directed by two research questions, both of which are broad and would merit a more thorough research than was possible in the present project.

1. How is ESD (or its variants) construed in educational policy in each of the Nordic countries?
2. Is there a common understanding of sustainability as an aim in education and as an approach in schools in the Nordic countries?

By reading through various policy documents, analysing them, and comparing them across the Nordic countries, we have at least an outline of an answer to the first question. The second question is more difficult to answer. Although there are various documents which offer an explication of the understanding of sustainability in that very document, it is more common that the reader is left in the dark about how to understand sustainability or, worse, the explications given within a certain domain – even in the same document – may be incompatible.

7.1 A common approach?

Compulsory education in the Nordic countries share some striking similarities, reflecting a strong emphasis on certain aspects of sustainability such as equality, democracy, and, possibly with the exception of Denmark, relatively strong focus on environmental education. This is in line with the conclusion of the Finnish scholar Ari Antikainen who, in 2006, tried to answer the question of whether there was a Nordic model of education:

I argue that I have found values or aims that have guided development of education. They are democracy, equality, progressiveness, and pragmatism. Social democracy, both as political movement and broader ideology, has had a crucial impact. The comprehensive school model has influenced both all national levels and forms of education and international development of education systems of other countries. The Nordic culture and lifestyle have provided a good basis for lifelong and life-wide learning, before it became general rhetoric. (Antikainen, 2006, p. 240)

Some of the values to which Antikainen refers as guiding the development of education – democracy and equality – are among the values mentioned in UNSDG 4.7. They are not only present in the educational policies in the Nordic countries but are fundamental (see Table 12, bottom line). The same holds for the strong emphasis on lifelong learning, although that was outside the scope of the present study. Thus, Antikainen's conclusion may still apply today – one can discern a common approach to education in the Nordic countries. When asking more specifically about a Nordic approach to sustainability education, the picture becomes more chaotic. In the

educational policies of the Nordic countries, sustainability is defined in very different ways, or not even defined at all (see e.g. Table 10).

Another aspect which is not clear how to interpret is the occurrence of the concept of *Bildung* in the educational policies of Denmark, Sweden, and Finland, often directly related to sustainability or issues of similar concern. Although the concept is complex, it refers to education as a moral development with a strong social undertone (Sjöström and Eilks, 2018; van Poeck, Lysgaard, Reid, 2018). In the latest Icelandic curriculum, a similar conception of education is presented, using the Icelandic word 'menntun' which sometimes is given a moral interpretation but can also be used in a more neutral meaning.

Insofar as sustainability education is related to a moral conception of education, tensions between a subjective and humanistic understanding of sustainability education, on the one hand, and a more natural science grounded and objective understanding, on the other, might not be as prevalent in the Nordic countries as in many other parts of the world (van Poeck et al., 2016). If this is right, then not only could the Nordic countries stand out in their understanding of sustainability education, but there might also be different possibilities to incorporate sustainability education into other subjects and education in general in the Nordic countries than in some other parts of the world.

7.2 A confusing picture

Although the Nordic countries share commonalities, as noted above, the analysis of sustainability education reveals a confusing picture. While Finland, Iceland, Norway, and Sweden all present sustainability as an explicit concern for compulsory education, integrating sustainability into various aspects of the school, Danish legislation and curriculum approach sustainability more as an implicit concern through the importance of human interaction with nature and through various social aspects of sustainability. But even within the countries where sustainability is an explicit concern, and has been so for some time, there are causes for concern.

In Iceland, for instance, policy seems to be a mixture of a strong emphasis on sustainability and an utter lack of such emphasis. The law on compulsory education from 2008 has very little to say directly about sustainability and, insofar as it mentions elements related to sustainability, such as democracy and equality, it is without elaboration. However, after the financial collapse of 2008, sustainability, democracy and human rights, equality, health and well-being, creativity, and literacy were defined as fundamental pillars of all education, from preschool through upper secondary education (Ministry of Education, Science, and Culture, 2014; Jónsson, 2018). In the curricula published in 2011, sustainability was elaborated not only as first order learning (the cognitive domain) but also as second order learning (the intentional domain) and given prominence as one of the main concerns of compulsory education. However, the Ministry did not do much in the way of implementing the policy apart from publishing short books on each of the six pillars (Helgadóttir, 2013, on sustainability). Two years later, after another change of Ministers of Education, the Ministry returned to individualistic educational concerns about reading framed almost entirely within first order learning, silencing the six pillars. Another change of government took place in the fall of 2017 with a new

Minister reviving the six pillars of the 2011 curricula and initiating an inter-Nordic project on youth involvement in education for sustainable development (Nordic Council of Ministers, 2018). To what extent such initiatives translate into local educational policy remains to be seen.

Inclusion of sustainability in educational policies in Finland, Norway, and Sweden builds on a long tradition of environmental education and has, in many ways, been more consistent than in Iceland or Denmark. However, neither the Finnish, Norwegian, nor the Swedish educational acts mention sustainability explicitly and, although the word 'sustainability' or its variants appear almost 200 times in the Finnish national core curriculum, the incorporation of sustainability as an educational aim or subject is often superficial. This superficial inclusion of sustainability in educational policy becomes even more evident when looking at teacher preparation in some of the Nordic countries where the importance of sustainability education is often better addressed in political rhetoric than in educational reality.

Although sustainability education has a clear application in the fields of social and political life and economic activities in all of the Nordic countries, it is still the case that when sustainability education is discussed, an environmental perspective is most often taken. This may be due to the fact that sustainability education – or education for sustainable development – originated as a concern in schools within environmental education, at least in Finland, Norway, and Sweden, and it still has some of the character traits as a subject area within the environmental sciences.

7.3 A paradoxical situation

In 2019, when the current work on mapping sustainability education in compulsory education in the Nordic countries began, the Nordic Council of Ministers published two documents that are of direct relevance for the present work: a Nordic Strategy for Sustainable Development titled *Good Life in a Sustainable Nordic Region: Nordic Strategy for Sustainable Development 2013–2025* (Nordic Council of Ministers, 2019) and an analysis of the attitudes of Nordic youth towards sustainability issues, *Nordic Youth as Sustainable Changemakers: In the Transition to Sustainable Consumption and Production* (Ravnøel and Neergaard, 2019). These documents, published by the same organization in the same year dealing with the same issues, appear to be worlds apart.

In a foreword to the strategy, *Good Life in a Sustainable Nordic Region*, Rigmor Aasrud, Minister for Nordic Cooperation in Norway, says:

The Nordic Council of Ministers' Strategy for Sustainable Development provides general guidelines for the coming years. Sustainable development involves meeting the needs of present generations without compromising the ability of future generations to meet their own needs. The Nordic countries have consistently common views on key social issues, and the countries agree that social development must be sustainable. (Nordic Council of Ministers, 2019, p. 5)

A couple of pages later, in an introductory chapter, the role of this Nordic Strategy for Sustainable Development is described in the following way:

The Nordic Strategy for Sustainable Development is the overriding and cross-

sectoral framework for the work of the Nordic Council of Ministers, and is in line with the ambitions and goals of the 2030 Agenda. (Nordic Council of Ministers, 2019, p. 7)

Although the Strategy is not a document directly related to educational policy in each of the Nordic countries, it is an official document that "has been approved by all of the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) and the Faroe Islands, Greenland, and Åland" (p. 4) and defines goals and indicators for the educational sector in the Nordic region as a whole. In the introduction, the Strategy describes the situation with respect to sustainable development in the Nordic region in the following way:

The Nordic countries took a position in sustainable development of society from an early stage. The Nordic welfare model is based on all people having equal value, respect for human rights, justice, equality, good administration, low level of corruption, democracy, and promotion of health and well-being. Gender equality, openness and commitment are other important pillars. The success of the Nordic countries is also a result of affirming, from an early stage, economic openness and free trade. Decades of targeted environmental initiatives have improved the status of the environment in many areas. (p. 7)

This description, some might argue, is less critical than might have been expected. Although the Nordic countries have highly developed educational systems and people like to think of themselves as living in societies which reflect a high level of education where human rights are respected, people enjoy equality and democracy, rule of law is respected, and access to a clean environment is perhaps better than in most parts of the western world, the situation is rather paradoxical. While these indicators show good standing with respect to sustainability, other indicators show that the Nordic countries are among the least sustainable in the world. One measure of how much strain human living puts on the planet is the so-called Earth Overshoot Day.

To determine the date of Earth Overshoot Day for each year, Global Footprint Network calculates the number of days of that year that Earth's biocapacity suffices to provide for humanity's Ecological Footprint. The remainder of the year corresponds to global overshoot. (Global Footprint Network, n.d.)

In the year 2020, this day fell on August 22nd for the world as a whole and, because of COVID-19, it had moved back since 2019 when it was on July 29th. When the Earth Overshoot Day is calculated for each country, the Nordic countries turn out to be among those with the largest ecological footprint in the world. The Earth Overshoot Day in Denmark is on March 28th, in Sweden on April 2nd, in Finland on April 5th, and in Norway on April 18th (Global Footprint Network, n.d.). Official numbers are not available for Iceland, but it is estimated to be sometime in February. From this perspective, the Nordic countries are among the least sustainable in the world, something that ought to be a definitive fact in framing a sustainability strategy for the region in general, and a strategy for sustainability education in particular.

Youths seem to be more concerned about the actual situation than the authors of the Strategy, as is evident by 89% of young people being extremely concerned or very concerned about the future in relation to the climate and environment (Ravnbøl and Neergaard, 2019, p. 10). The disparity between the official strategy and the views of the youth is reflected in the fact that young people gain little inspiration

from political leaders (p. 4) who they feel are more concerned with talking than real action.

The interviews with the young sustainable changemakers showed they are very concerned about the complete lack of action from politicians, who do no more than talk about climate change. They see things getting worse, but still no action. The survey respondents feel frustrated that it is only young people taking action. The combination of increased awareness and knowledge about global climate crisis with lack of political action exacerbates the growing concern and worry. (Ravnbøl and Neergaard, 2019, p. 12)

The report relies on the Brundtland Commission from 1987 for a definition of sustainable development:

Definition of sustainable development according to the Brundtland Commission: Sustainable development meets the needs of the present generation without compromising the ability of future generations to meet their own needs. (p. 8)

The entire field of sustainability studies has been transformed during the more than three decades since the publication of the Brundtland report, *Our Common Future*, which makes the reliance on this definition surprising. Moreover, this conception of sustainable development has been criticized for being overly human-centred and not being critical of the conception of needs that sets the baseline for sustainable development.

More surprising than this reliance on an old definition of sustainable development is the stringent emphasis in the Nordic Strategy on growth; the word 'growth' appears twenty-three times, often combined with 'economic' or 'green':

The initiative of the Nordic Prime Ministers for green growth plays an important role in this context. Greater competitiveness and growth will be attained through more effective use of resources, more sustainable use and supply of energy, and more precise legislation about and pricing of natural resources. (p. 9)

Many would argue that what is needed to achieve sustainability is not more growth, but a different conception of the good life where people adopt a critical attitude towards their conception of needs and the quality of life is not measured by economic wealth but by, say, equality and harmony with nature. Youth in the Nordic countries seem to be more critical in this respect than the authors of the Strategy:

The sustainable changemakers do not see sustainable consumption and living as a sacrifice, and prefer to highlight the positive aspects and personal benefits. Highlighting the positive sides of sustainable lifestyles could serve as a counterculture to current habits of consumption, waste, food, and transportation. The sustainable changemakers could be seen as role models, portraying not only how people can live sustainably but also how they can actually lead a better life. (Ravnbøl and Neergaard, 2019, p. 23)

7.4 Education in Nordic Strategy for Sustainable Development 2013–2025

The Nordic Strategy for Sustainable Development is divided into five focus areas, the fifth 'Education, Research, and Innovation' obviously having special relevance for the current research. Each focus area is related to certain specific UNSDGs, but it is surprising that education as a focus area in the Strategy is related to Goals 4.3 (about equal access), 4.4 (increase the number of those having relevant skills for employment), and 4.5 (eliminate gender disparities) but not to 4.7. From the point of view of the present work, this looks like an unfortunate omission. More relevant for the present work, however, is the conception of education that figures in focus area five of the Strategy. The discussion begins by emphasising the importance of education for the green economy:

Good bases for education, research, and innovation are important components for a green economy. Greater knowledge about sustainable development forms the basis for changing attitudes and behaviour in individuals, companies, and organisations. Knowledge is required to find solutions to future challenges in the work to attain sustainable development. Knowledge and new technology, but also the ability to use people's competences, are pillars of Nordic competitiveness and have helped to create internationally successful companies. (Nordic Council of Ministers, 2019, p. 43)

Here we see the aims of education defined with respect to the green economy. In the objectives up to 2025 for education, this borrowing of educational aims from the economic sector is repeated:

Knowledge about sustainable development will be included in education at all levels. More young people in Nordic countries will study on educational programmes that provide the competences required by the business community. (Nordic Council of Ministers, 2019, p. 45)

It is striking that a report on sustainability should make the business community define the aims for sustainability education, not only because the business community has proven to be grossly unsustainable but also because the Nordic countries have a strong tradition of defining education in different terms, reflected, for instance, in the frequent use of the term '*Bildung*' to describe the conception of education in the region. The Nordic countries also pride themselves on a strong tradition of democracy, equality, and other social values, along with a strong culture of environmental education, which would be a much better fit for setting the aims for sustainability education.

Furthermore, the very conception of education presented in the document is not only extremely technical but naively so; the good of education is defined in instrumental terms and, moreover, it seems to be taken for granted that education is primarily about transmission of knowledge and that greater knowledge eventually leads to a change in attitudes and behaviours. Fifteen years ago, UNESCO urged people to think critically about education as a means to change:

We are faced with a paradox: Is education the problem or the solution in working toward a sustainable future? At current levels of unsustainable practice and over-consumption, it could be concluded that education is part of the problem. If education is the solution, then it requires a deeper critique and a broader vision for the future. Thus, whole systems redesign needs to be

considered to challenge existing frameworks and shift our thinking beyond current practice and toward a sustainable future. (UNESCO, 2005, p. 59)

Sterling, who we referred to in the second chapter of this report, when explicating our conception of sustainability education, elaborates the same point as UNESCO is making in the above quote:

... most mainstream education *sustains unsustainability* – uncritically reproducing norms, by fragmenting understanding, by sieving winners and losers, by recognizing only narrow part of the spectrum of human ability and need, by an inability to explore alternatives, by rewarding dependency and conformity, and by servicing the consumerist machine. (Sterling, 2001, pp. 14–15)

It should be evident by now, after several decades of education for sustainable development – decades which have seen increased unsustainability in almost every aspect of human living – that conventional education is rather a part of the problem than a key to solving it. The whole systems redesign for which UNESCO called fifteen years ago has not taken place. Unsustainable frameworks have not been challenged and the latest Sustainability Strategy for the Nordic Region is no exception.

7.5 Listening to youth

The present project is concerned with sustainability education in the Nordic countries and it is part of the Iceland Presidency Project for the Nordic Council of Ministers. The overall focus of the Presidency Project is on young people:

The Icelandic Presidency will focus on issues concerning young people in the Nordic region – the generation born around the turn of the century beginning to make its way in life. We want to listen to young people and support projects that promote education, culture, and health. (Nordic Council of Ministers, 2018, p. 5)

In line with this emphasis, we find it fitting to end this report on sustainability education in compulsory education in the Nordic countries by quoting the young person from the north who has, more than anybody else, placed education and sustainability on the agenda. Greta Thunberg was around eight years old when she first learned about climate change. She became shocked and depressed a few years later, but then realized that she could make a change in this world.

I kept thinking about it and I just wondered if I am going to have a future. And I kept that to myself because I'm not very much of a talker, and that wasn't healthy. I became very depressed and stopped going to school. When I was home, my parents took care of me, and we started talking because we had nothing else to do. And then I told them about my worries and concerns about the climate crisis and the environment. And it felt good to just get that off my chest.

They just told me everything will be all right. That didn't help, of course, but it was good to talk. And then I kept on going, talking about this all the time and showing my parents pictures, graphs and films, articles and reports. And, after

a while, they started listening to what I actually said. That's when I kind of realised I could make a difference. And how I got out of that depression was that I thought: it is just a waste of time feeling this way because I can do so much good with my life. I am trying to do that still now. (Watts, 2019, March 11)

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Appendix: The organisation and dissemination of the work

Organisation of the work

The work presented here is part of the Icelandic Presidency for the Nordic Council of Ministers initiated in 2019 under the heading *A Common Path* (Nordic Council of Ministers, 2018). Initial planning began in the spring of 2018 in meetings with Guðni Olgeirsson and Björk Óttarsdóttir, senior advisors at the Icelandic Ministry of Education, Science, and Culture, and Victor Berg Guðmundsson, director at Youth Work Iceland, together with Ólafur Páll Jónsson, professor at the School of Education, University of Iceland. In April 2019, Jónsson was appointed to lead the work. Recruitment of people from the other Nordic countries began right away and by late May 2019 a group of researchers had been formed. The group held its first online meeting on June 19th. On September 22nd and 23rd, the group met at the Danish School of Education in Copenhagen. Master's students working on the project had been recruited by then and the whole group worked together to both define the project better and distribute the work among the group members.

The group planned to meet again in the spring of 2020, first at the NERA conference and then have a final meeting to tie together loose ends and prepare a final report. Seven members were able to go to the NERA conference, which narrowly escaped the first major COVID-19 lockdown, but the final meeting could not take place. Moreover, due to the pandemic, the workload and working conditions of faculty and students increased dramatically. In the fall of 2020, the same situation was more or less repeated, which meant that the group could not meet again in person. Moreover, presentations at some conferences, such as the ECER 2020 in Glasgow, were simply cancelled.

Master's theses

The collection and analysis of data was in part carried out through research and supervision of five Master's theses listed here below:

Brückner, Mathilda (2020). *Bæredygtig dannelse i den danske folkeskole* (M.Ed. thesis). Danish School of Education, Aarhus University, Denmark.

Cockerell, E. (2020). *Sustainable development within primary teacher education in Finland: An analysis of university level teacher education* (M.Ed. thesis). University of Helsinki, Finland. Available from https://helda.helsinki.fi/bitstream/handle/10138/322315/Cockerell_Emelie_2020.pdf?sequence=2&isAllowed=y

Gunnarsdóttir, Bryndís Sóley and Árnadóttir, Sólveig María (2020). *Sjálfbærni til framtíðar: Innleiðing Heimsmarkmiðs 4.7 á Íslandi* (M.Ed. thesis, University of Akureyri, Iceland). Available from <http://hdl.handle.net/1946/36158>

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Høgskolen i Innlandet, Norway.

Sund, Marianne (2020). *På vei mot en mer bærekraftig framtid? Bærekraft, systemforståelse og naturfagkompetanse i gjeldende og kommende læreplanverk* (M.Ed. thesis). Høgskolen i Innlandet, Norway.

Dissemination of main results

Initial results from this project have been disseminated at two international conferences.

NERA 2020 (Nordic Educational Research Association) conference held in Turku, March 4–6, 2020

Education for Sustainable Development in the Nordic Countries: A Comparative Examination

Presented by: Ólafur Páll Jónsson

Authors: Ólafur Páll Jónsson, Bragi Guðmundsson, Anne Bergliot Øyehaug, Robert James Didham, Lili-Ann Wolff, Stefan Bengtson, Jonas Andreassen Lysgaard, Bryndís Sóley Gunnarsdóttir, Sólveig María Árnadóttir, Jørgen Rømoen, Marianne Sund, Emelie Cockerell, Paul Plummer, and Mathilda Brückner

Swedish Policymaking on Education for Sustainable Development (ESD): Institutional Alignments and Misalignments

Presented by: Paul Plummer

Authors: Paul Plummer and Stefan Bengtsson

Sustainability in Icelandic Elementary Schools – Case Studies

Presented by: Bryndís Sóley Gunnarsdóttir and Sólveig María Árnadóttir

Authors: Bryndís Sóley Gunnarsdóttir, Sólveig María Árnadóttir, Bragi Guðmundsson, and Ólafur Páll Jónsson

TEPE 2020 (Teacher Education Policy in Europe) conference held online at the University of Helsinki, May 13–15, 2020

Sustainability in Nordic Teacher Education

Presented by: Lili-Ann Wolff

Authors: Lili-Ann Wolff, Emelie Cockerell, and Ólafur Páll Jónsson

Results from the project were also presented at the annual conference of the School of Education at the University of Iceland.

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About this publication

Mapping Education for Sustainability in the Nordic Countries

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ISBN 978-92-893-6953-4 (PDF)

ISBN 978-92-893-6954-1 (ONLINE)

<http://dx.doi.org/10.6027/temanord2021-511>

TemaNord 2021:511

ISSN 0908-6692

Cover photo: Yadid Levy / Norden.org

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