

Chapter 12

Equity and Diversity in Reading Comprehension—A Case Study of PISA 2000–2018



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Abstract This chapter studies equity in reading performance in PISA 2000–2018 in three Nordic countries: Denmark, Sweden and Norway. Using regression analyses, the study investigates how the reading performance trend for groups of students with different genders, home backgrounds and minorities has developed. The study is contextualised through an up-to-date description of reading comprehension instruction in the countries. In addition to trend analyses of general reading performance, the study examines if the differences between groups of students are consistent across different text formats in the digital version of the PISA test, distinguishing between static text types (e.g., articles, letters, stories) and dynamic text types (e.g., websites, forums and e-mails, etc.). We find a consistently high reading literacy performance in all Scandinavian countries compared with international development. There are large gender differences in the average reading performance in all three countries, disfavours boys, especially low-performing boys from low SES home backgrounds. We find a huge and stable gap between minority and majority students' reading achievement, even when corrected for SES. Taking these findings into account, we assert that there is no basis for concluding that the school systems give more equitable learning conditions for groups of students now than when the PISA assessments started. However, it appears that the new online text formats in PISA 2018 might shrink the differences between student groups. Based on our findings, we argue that it is highly doubtful if one can still speak of a Nordic model of education, both as an idea of equity and fairness and as a model that is united across the Nordic countries.

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In the Nordic educational systems, equity and equal opportunities are among the primary aims of schooling; they are based on the belief that if all students are given equal learning opportunities, equity will be obtained (Telhaug, Mediås, & Aasen, 2006). Indeed, the Nordic education model has been regarded as exemplary in ensuring social cohesion, justice and security, with equal access and learning opportunities for all (Telhaug, Aasen, & Mediås, 2004). However, several researchers have noted that it is debatable whether we can still talk about a joint Nordic model regarding policies, school choice and school competition (Klette, 2018) and that the differences in these areas starting in the early 2000s to today threaten the Nordic model (Lundahl, 2016). In this chapter, we examine the question of equity in the Nordic school system from the perspective of reading literacy because it is a centrepiece of basic schooling in Nordic countries and worldwide. Reading literacy is a key competency and life skill because a certain level of reading proficiency is needed to learn other subjects at school, undertake further education and work and participate in societal life (OECD, 2019a; UNESCO, 2004). Likewise, longitudinal studies indicate that students with insufficient levels of reading in the PISA assessment have a higher risk of not completing further schooling or education (Piacentini & Pacileo, 2019). In the current study, we perceive students' reading proficiency as an indicator of equity in the school systems, here by looking at the assessments of students' reading literacy in PISA. In the chapter, we set out to examine Nordic students' reading performance and the trend of reading performance development over time for different student population groups while also looking at the new text formats introduced in the reading assessment test in PISA 2018.

When the first results of PISA 2000 were published (OECD, 2001), it became clear that not all students in the Nordic countries were proficient readers; furthermore, the results revealed that in addition to individual variations between students, there were systematic differences in reading proficiency between groups of students (e.g., in relation to gender, socioeconomic status and language background; Andersen et al., 2001; Lie, Kjærnsli, Roe, & Turmo, 2001; Molander, Pettersson, Skarlind, & Taube, 2001). The PISA results were one factor leading to important changes in Nordic educational policies that moved towards improving the students' reading proficiency and reducing the proportion of low-performing readers (Mejding, 2019).

The PISA study design makes it possible to compare students' reading performance over time and between different groups of students. These comparisons provide valuable information on the extent to which the educational system in different countries supports equality and equity for students. Twenty years have passed since the first PISA study, so we consider it relevant and important to investigate the impact of the reforms and initiatives, examining whether they have led to changes

in student reading trends in the Nordic countries and whether these changes can be translated into a larger degree of equality and equity.

Regarding the text format for the reading assessment, significant changes were made to the test design in PISA 2018. In the previous PISA studies, the reading assessment was constructed based on traditional reading materials in single texts displayed in paper booklets. Although the digitisation of the PISA assessments began in PISA 2015, substantial changes did not take place in the reading domain before the development of new reading material for PISA 2018 (Støle, Mangen, Frønes, & Thomson, 2018). In PISA 2018, the assessment was expanded with two new text formats: *multiple texts* and *dynamic texts*. Multiple texts are several texts on the same theme organised into a text unit (OECD, 2019a). For our purposes, dynamic texts refer to interactive hypertext where the readers choose their own reading path, here including texts designed for the Internet and social media. Studies have shown that gender and home background seem to have less of an effect on students' performance in Nordic countries, among others, when reading digital texts compared with reading traditional texts (Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014; Frønes & Narvhus, 2011; Olsen, Hatlevik, & Loi, 2015; Rasmusson, 2016). However, none of these studies have investigated whether the weakened effect on performance is covaried with the digital format, the text types or the reading tasks. Hence, it is relevant to investigate whether different groups read the new text formats in PISA differently or, in other words, if the new dynamic and multiple texts promote or hinder equity in the school system in a Nordic context.

In this chapter, we set out to answer two research questions. First, how has student equity in the Nordic countries, as indicated by reading performance in PISA, developed between groups of students of different socioeconomic (SES), gender and language backgrounds in the period 2000–2018? Second, do the new text formats in PISA 2018 (dynamic and/or multiple texts) strengthen equity in reading performance for the same groups of students?

A couple of aspects regarding the research questions need clarification. We focus on Norway, Sweden and Denmark as representatives of the Nordic school systems. We chose these three Scandinavian countries because of their similarities in language, culture, school systems and curriculum (Imsen, Blossing, & Moos, 2017). Finland and Iceland have less in common linguistically, culturally and regarding the school systems than the chosen Scandinavian countries.

Our understanding of equity in relation to reading literacy is in line with Espinoza (2007), whose ideas are explained in detail in Chap. 2 in this book. Thus, we consider that equity is obtained when students with similar abilities reach the same level of reading proficiency at a defined point in the educational system, here measured as educational achievement based on test performance (Espinoza, 2007, p. 353). In other words, the effect of home background and gender will be diminished in totally equitable educational systems, and the distributions of, for example, test scores would overlap between these subgroups. In the same way, equality is obtained when all formal obstacles (legal, political, social, cultural or economic) to achieve at the same level have been eliminated (Espinoza, 2007). As underlined by

Buchholtz, Stuart and Frønes in Chap. 2 of this book, the concepts of equity and equality are inextricably linked with the concept of diversity because diversity adds the perspective of ‘being different but of equal worth’ (Blossing, Imsen, & Moos, 2014, p. 7), which philosophically and ethically are necessary to approach equality and equity in educational contexts. They also point to the long Nordic tradition of legal rights to participate in free, public school for all students, unlike in many other school systems. In the present study, we include the perspective of diversity by focusing on and comparing different groups (gender and minority backgrounds) in the PISA population.

To contextualise the methodological and analytical parts of the study, we start the chapter with an outline of the major educational reforms and initiatives related to reading and literacy in Denmark, Sweden and Norway for the period 2000–2020; this is followed by a theoretical and research-informed account of online reading.

12.1 The Nordic Educational Context and Trends in Reading Development

Since the new millennium and the first PISA study (OECD, 2001), all three Scandinavian countries have witnessed significant changes to their educational systems that began with a number of political reforms and initiatives. Despite national differences regarding the specific nature of these reforms, according to Imsen et al. (2017), they share the same overall characteristics: a new and strong emphasis on competences, learning goals and learning outcomes, assessment and accountability with a corresponding downgrade of teaching, curricular content, and democratic *Bildung* (i.e., education, formation). Important here is that these characteristics are both part of and influenced by a strong general trend across Western countries in the first part of the twenty-first century (Antunes, 2012; Hodgson, Rønning, Skogvold, & Tomlinson, 2010; Moos, 2014; Sivesind, Akker, & Rosenmund, 2012); indeed, various Scandinavian scholars have analysed how this international reform trend poses serious challenges to the Nordic model of education (Imsen et al., 2017; Lundahl, 2016).

In all three Scandinavian countries, the national results of the first PISA studies, which placed the Scandinavian students around the OECD average, gave rise to disappointment and alarm, especially at the political level and among the public. This was popularly termed ‘the PISA shock’ (Mejding, 2019). Subsequently, the unsatisfactory national PISA results were a regular part of governments’ arguments for the necessity of educational reforms, thus playing a legitimising role regarding these reforms (Imsen et al., 2017). A part of the ambition behind the reforms, as well as various other educational initiatives, have been to improve students’ skills in the three subject domains tested in PISA (reading, mathematics and science). In the case of reading, a considerable number of different initiatives have been implemented in the Scandinavian countries over the past 20 years to improve literacy

instruction and students' literacy skills. A particular incentive behind most of these initiatives has been to reduce the number of students with insufficient reading skills (below level 2 in PISA) because the large proportion of students at this level in PISA 2000 challenged the values of equality and equity on which the Nordic educational model is based (Mejding, 2019).

Below, we enumerate the most important reforms and initiatives related to the domain of reading in the three Scandinavian countries since 2000.

12.1.1 Reforms and Initiatives in Denmark, 2000–2018

In this time period, three curricular reforms for compulsory school (grade Kindergarten to grade 9) have passed: in 2001 (Undervisningsministeriet 2001), 2009 (Undervisningsministeriet 2009) and 2014 (Undervisningsministeriet 2014). All three reforms have been based on learning goals, and each has had a stronger emphasis on reading as part of the curriculum for Danish language arts. In the last and current reform in 2014, reading constitutes one of the four main competences for Danish as first language (L1) across all grade levels. In addition, reading and literacy have become a cross-disciplinary 'theme' for all subject areas and across all grade levels. The approach towards reading in the 2014 curriculum corresponds to a large degree to PISA's definition of reading literacy.

2006–2007. Introduction of a mandatory national test of reading and other subject areas (math, English and science). The students take reading tests in the 3rd, 6th and 8th grades, focusing on basic technical skills (based on the simple view of reading) yet aligning poorly with the national curriculum for reading and with PISA's conception of reading (Bremholm & Bundsgaard, 2019).

2007. Introduction of a national written exam in reading proficiency at the end of compulsory school (grade 9). The exam focuses on reading speed and basic technical skills, but alignment with the national curriculum and the PISA's definition of reading is weak (Bremholm & Bundsgaard, 2019).

2007–2009. Implementation of an in-service training programme for teachers to be certified as reading counsellors. The training programme is managed by the six Danish university colleges, and to begin with, the programme was supported by substantial governmental funding (Kuhlman & Rydén, 2011). Today, almost all compulsory schools in Denmark have a reading counsellor, and many schools have more than one (EVA, 2009).

2006 and 2012. The latest two reforms of national teacher education have put a stronger emphasis on reading and literacy, reading development and reading instruction. Furthermore, they have introduced grade-level specialisation, which includes reading. In Denmark, teacher education is regulated at the national level, and it is managed by the six university colleges across the country.

2006. The National Centre for Reading was founded by a governmental initiative. The purpose was to promulgate research-based knowledge on reading and

literacy to schools, teachers and teacher education, as well as to do research and developmental projects in the field of reading and literacy.

12.1.2 Reforms and Initiatives in Sweden, 2000–2018

2011. Following a new school law (SFS, 2010:800), the latest curricular reform for compulsory school (Lgr11) was introduced. This curriculum (and current) is based on proficiency levels and key subject matter content instead of learning objectives, as was the case in the previous curriculum from 1994 (Lpo94). Reading comprehension is given a much more prominent role in the 2011 curriculum compared with its predecessors.

2013 and onwards. Initiation of *Boost for Reading [Läsflytet]*, an in-service training literacy programme for teachers. The programme was organised by the Swedish National Agency for Education and was fully implemented between 2015 and 2018 (Carlbaum, Andersson, & Hanberger, 2016). In 2017, about 30,000 teachers had enrolled in the programme.

2015 and onwards. Implementation of *Cooperation for Better Schools [Samverkan för bästa skola]*, a governmental initiative to support low-performing schools with an explicit aim to raise student achievement. The initiative is led by the Swedish National Agency for Education. By 2019, 252 schools have been involved in this school development project.

2017. Adoption of an amendment to the school legislation to digitalise the national tests and strengthen the influence of the tests on the students' grades to increase equity in grading. In Sweden, all students take national tests in both reading and writing in Swedish language arts in the 3rd, 6th and 9th grades. This digitisation and new framework for assessment is planned to take effect in 2022.

2019 and onwards. A guarantee for early support was added to Swedish school law. Schools are obliged to map the students' reading, writing and mathematical abilities in the preschool class and in the first grade to ensure that students with special needs will get support at an early stage in their schooling.

12.1.3 Reforms and Initiatives in Norway, 2000–2018

2003 and onwards. Increased emphasis on students' early reading development through close monitoring by teachers and the use of mapping tests (Roe, 2012). Students who show signs of reading or numeracy difficulties receive help at an early stage, and starting in 2018, a responsibility to provide intensive instruction for students in danger of being left behind in the 1st to 4th grades was established by law.

2003 and onwards. A number of national reading initiatives have been implemented. The first and costliest, *Opportunities to Read [Gi rom for lesing!]*, was launched by the Ministry of Education in 2003 and completed in 2007. The main

goals were to improve the reading skills of children and adolescents, motivate them to read more, strengthen teachers' competence in literacy education and raise awareness of reading as a gatekeeper for learning, cultural competence, quality of life and community participation (UFD, 2003).

2003. Several educational research centres were established, among these the Norwegian Reading Centre [*Lesesenteret*] and the Norwegian Centre for Writing Education and Research [*Skrivesenteret*].

2006. Implementation of a comprehensive national curriculum reform (LK06) known as the *Knowledge Promotion Reform* [*Kunnskapsløftet*] (Aasen et al., 2012). The Knowledge Promotion Reform is often characterised as a literacy reform because of its explicit focus on the use of oral and written language as tools in all subjects (Berge, 2005).

2007. The *Quality Assessment System* (NKVS) was established as a part of the Knowledge Promotion Reform, and national reading tests were developed and implemented with an explicit focus on the formative role of the tests (Jensen, Frønes, Kjærnsli, & Roe, 2020). From 2007 onwards, all students at the beginning of the 5th and 8th grades take national tests in reading, numeracy and English.

2010. Initiation of *Assessment for Learning* [*Vurdering for læring*], a nationwide initiative where school owners, schools and learning enterprises receive support to further develop their assessment culture. Assessment for learning was introduced as an educational principle and as part of the Knowledge Promotion Reform in 2006. It promotes criterion-based assessment, linking the criteria to curriculum goals and with the characteristics of mastery levels.

12.1.4 Trends in Reading Development

Despite the national differences, there are interesting common traits behind the initiatives and reforms. We argue that these traits can be characterised as an embedded or integrated approach to literacy instruction as opposed to the approach applied before 2000, which considered reading as primarily a technical skill pedagogically limited to the primary grades. The embedded approach to literacy considers reading and writing as an integrated part of all subjects and all communicative practices across grades. We find aspects of this approach towards literacy instruction in elements such as literacy-based curriculum reforms, the introduction of standardised and validated tests and mapping tools for formative assessment, early efforts, reading stimulating campaigns and the widespread use of reading counsellors.

The brief descriptions of the educational context in the Scandinavian countries will be used in this chapter to discuss reading literacy development. Likewise, in the final part of this section, we give a quick overview of the PISA results in reading for Denmark, Norway and Sweden as background knowledge for the analyses. In Fig. 12.1, the overall performance in reading literacy in Denmark, Norway and Sweden from 2000 to 2018 is shown.

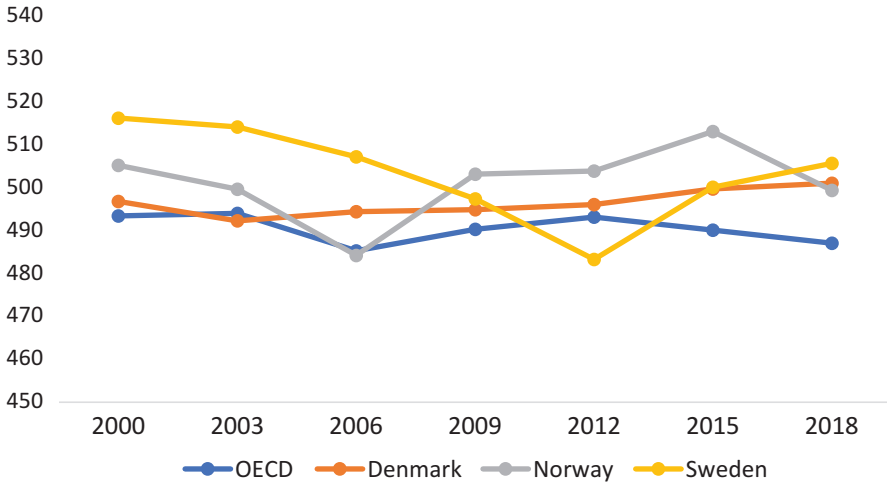


Fig. 12.1 Average performance in reading literacy in PISA 2000–2018 (see also, e.g., OECD, 2019b)

Table 12.1 Average performance in reading literacy by gender in PISA 2000–2018

		Female		Male		Diff F-M
		Average	S.E.	Average	S.E.	
2018	OECD	502	0.5	472	0.5	30 ^a
	Denmark	516	2.3	486	2.3	30 ^a
	Norway	523	2.6	476	2.6	47 ^a
	Sweden	523	3.4	489	3.2	34 ^a
2009	OECD	510	0.5	471	0.6	39 ^a
	Denmark	509	2.5	480	2.5	29 ^a
	Norway	527	2.9	480	3	47 ^a
	Sweden	521	3.1	475	3.2	46 ^a
2000	OECD	510	0.8	478	0.9	32 ^a
	Denmark	510	2.9	485	3	25 ^a
	Norway	529	2.9	486	3.8	43 ^a
	Sweden	536	2.5	499	2.6	37 ^a

^ap <.05

As shown in Fig. 12.1, Denmark, Norway and Sweden have statistically significantly higher results than the OECD average in PISA 2018 and with no significant difference between the three countries. According to recent trend analyses, Norway and Denmark are among the few OECD countries that have stable performance close to the OECD average in all PISA cycles, while Sweden has a negative trend line (Jensen et al., 2020; OECD, 2019b).

In all three countries, the performance differs between groups of students. Table 12.1 gives an overview of boys' and girls' average performance for all PISA cycles.

In all three countries, as well as for the OECD average, girls perform statistically above boys in reading literacy. In PISA 2018, girls in all three countries performed significantly higher than the OECD average for girls. The same was the case for Danish and Swedish boys, who performed above the OECD average for boys. Norwegian boys performed at the OECD average.

12.2 New Reading Challenges in the Digitised World

According to Coiro (2003), reading and understanding online texts can set new literacy practices in motion, and when this occurs, readers need to activate both traditional and fundamentally new thought processes. Expert readers use their usual strategies when reading online: they activate prior knowledge on the text and topic, identify the main themes and monitor their own understanding (Coiro, 2011). In addition, good readers are experts in doing web searches, reviewing search results and managing and comparing multiple text representations. In this section, we point to previous research on how online reading is related to the features of text, the reader's cognitive processes, prior knowledge and ability to spatial orientation and the reader's reading comprehension strategies.

Texts organised as hypertext impose a greater cognitive burden on readers, and the ability to effectively use strategies is crucial to avoid cognitive overload and, thus, confusion and disorientation (Lawless & Kulikowich, 1996; Shapiro & Niederhauser, 2004). Theories of cognitive flexibility have indicated that the lack of a supportive structure in dynamic texts raises the demands on the reader, who must devote more resources and metacognitive effort to adapt to new and ever-changing texts with multiple representations of information (Coiro, 2011; Spiro, Feltovich, Jacobson, & Coulson, 1992; Spiro, Klautke, & Johnson, 2015). Wylie et al. (2018) showed how the reading of online dynamic texts puts additional demands on executive functions, potentially threatening comprehension and learning because of shallow processing. Extensive research on the additional evaluation and sourcing processes related to reading dynamic texts has agreed that such processes raise the demands on the reader (e.g., Bråten et al., 2011; Kiili, Laurinen, & Marttunen, 2008; Salmerón, Strømsø, Kammerer, Stadler, & van den Broek, 2018).

Other studies have shown that readers need to develop corresponding online comprehension strategies. When reading hypertext online, the reader encounters layers of 'possible links, possible texts, possible decisions and possible interactions' (Afflerbach & Cho, 2009, p. 81). It is clear that even proficient readers with satisfactory reading strategies for single and static texts experience the interaction with the text as more demanding and complex. Afflerbach and Cho pointed to three areas where the reading process of static and dynamic texts differ: (a) the process of constructing a text while reading, (b) the need for strategies that can help manage the information load on the working memory and (c) special strategies for self-regulation (2009, p. 81).

As mentioned in the introduction, the change in the delivery mode starting with PISA 2015 has led to new text types in the reading assessments, with texts inspired by online genres that can be labelled as dynamic texts. In PISA 2018, dynamic texts were a part of the regular reading assessment for the first time (OECD, 2019a). In addition, *text source* was introduced as a text format dimension, dividing single texts from multiple texts (several texts from different sources on the same topic). A multiple text unit might contain unique, overlapping and/or conflicting information and incorporate reading processes such as evaluating the veracity of texts, seeking information, detecting and evaluating conflicting information and integrating/synthesising information across sources (OECD, 2019a, p. 24). By incorporating these new text formats, a number of new genres were also introduced in the PISA 2018 reading assessment, including webpage, online forum, e-mail, blogs, newspaper, online search and chat. With our second research question, we examine if digital reading as represented by the new text formats in PISA 2018 influences equity regarding the students' reading performance. Before we present results for the first research question – how reading performance in PISA has developed between groups of students – we will account for the methods used.

12.3 Methods

Measuring equity in educational systems in general is a complex issue (Chap. 3), and it is not investigated thoroughly enough by only reporting achievement gaps. Therefore, in our study, we have taken SES, gender and minority background into account. Furthermore, we have specifically focused on equity aspects in the field of reading literacy. We argue that the subject-specific aspects of equity are important to consider, and in the field of reading literacy, the recent change towards more digital reading needs to be appraised.

In this section, we firstly provide an account of the PISA data and of the Danish, Norwegian and Swedish samples used in the current study. Furthermore, we describe the analytical tools and procedures we applied, along with our methodological choices and reflections.

12.3.1 PISA Data

The major domain in the PISA studies shifts between the three standard subject domains (reading, mathematics and science) at each 3-year cycle. Hence, reading is the major domain every ninth year, and we have chosen to use data from these cycles: PISA 2000, 2009 and 2018. In PISA, the students' performance in reading literacy is reported as plausible values and computed as a proficiency distribution around a reported value by assigning a set of values drawn from this distribution (OECD, 2009). This method reduces errors in the analysis on the population level (Braun & von Davier, 2017; Rutkowski, Gonzalez, von Davier, & Zhou, 2014). In the current study, we used the plausible values for students' performance on the overall reading

performance and for the subcategories of reading multiple and single texts. In addition, an index of students' socioeconomic background was used. In PISA 2000, this index was the international socioeconomic index of occupational status (HISEI), which is derived from items on parents' occupation in the student questionnaire. In the following PISA studies, the new index of economic, social and cultural status (ESCS) was used; this index is derived from a number of items in the student questionnaire about parents' education and occupation, home possessions (such as possession of a car, the existence of a quiet room to work, access to the Internet, the number of books and other educational resources). In sum, we used the ESCS index, immigrant background and gender from the student questionnaire (OECD, 2019c).

In addition to the plausible values in reading literacy and background variables, we wanted to analyse new text formats in PISA 2018. Plausible values for static and dynamic items were not available, so we used the proportion of items answered correctly and omitted items. Because of a new multistage adaptive test (MSAT) implemented in PISA 2018 for the computer-based reading assessment, the values for the correct proportions are computed in a different way than before. These new equated proportion correct statistics were used to compare the performance on items classified as dynamic and static for Denmark, Norway and Sweden. The main idea behind MSAT is that students will have to answer fewer items, but the items they answer are better adjusted to their proficiency level. In total, the test included 245 reading items belonging to 45 units in three blocks. The new method for computing the equated correct proportion was based on item response theory and mean deviation statistics (ETS, 2019; OECD, 2020).

12.3.2 Sample

Table 12.2 presents an overview of the samples used in PISA 2000, 2009 and 2018 in the three countries. Hereafter, the first- and second-generation students are labelled as minority students and the native students as majority students. Since

Table 12.2 The samples in the three countries in PISA 2000, 2009 and 2018

	All	Female	Male	Native/ Majority	Second generation	First generation	Minority
2000							
Denmark	4212	2099	2113	3835	85	198	283
Norway	4082	2014	2068	3746	74	193	267
Sweden	4383	2153	2230	3828	195	280	475
2009							
Denmark	5924	3038	2886	4478	931	358	1289
Norway	4660	2285	2375	4305	167	146	313
Sweden	4567	2256	2311	3993	344	163	507
2018							
Denmark	7657	3816	3841	5858	1282	269	1551
Norway	5813	2880	2933	4882	348	347	695
Sweden	5504	2763	2741	4283	556	499	1055

2009, Denmark has had an oversample of immigrant students (Beuchert & Christensen, 2019; Egelund, 2010). In PISA 2000, there was not an index labelled ‘immig’, but instead, we computed an index from questions in the student questionnaire in PISA: Was the student born in the country? Was the mother and/or the father born in the country? According to PISA, native students are those born in the country in which they were assessed by PISA or who have at least one parent who was born in that country. Immigrant students are those with an immigrant background, and they can be either first generation (those who are foreign born and whose parents are also foreign born) or second generation (those who were born in the country of assessment but whose parents are foreign born) (OECD, 2011, p. 1).

12.3.3 *Analyses*

The current study comprises groupings based on different criteria, including gender (boys and girls), socioeconomic and language background (majority and minority) and a case analysis of the trend development in the three Nordic countries. The analyses include both average reading results for the groups through PISA 2000, 2009 and 2018—when reading was the main area of research—and their subscores on text types in PISA 2018. The analyses were performed using Stata, SPSS, IEA IDB Analyzer and PISA Data Explorer. Using descriptive statistics and regression analysis, estimates of the contribution of gender and immigrant background to the overall performance in reading literacy and performance on multiple and single texts were separately calculated for each country. In the models, socioeconomic status (the index HISEI in PISA 2000 and ESCS in the following PISA surveys) was considered. There is reason to exhibit caution when comparing these indicators across countries and over time (OECD, 2019c). Studies have shown that a comparison raises several challenges (Rutkowski & Rutkowski, 2013, 2017), so we have chosen not to compare ESCS trends between cycles but rather to compare the contribution of socioeconomic background to reading literacy performance in separate regression models. The standardised beta (β) coefficients were used to estimate the difference between the regression models. The β coefficient gives an estimate of the strength of the effect of each individual independent variable to the dependent variable. The higher the absolute value of the beta coefficient, the stronger the effect. To answer RQ 2, we used the equated proportion’s correct values for each item. The reading items were classified as either static or dynamic. The average proportion of both correct answers and omitted tasks for the items categorised as static and dynamic, respectively, was computed per country. In the analyses of the proportion of correct and omitted items, we used descriptive statistics to compare the dynamic and static items answered correctly or that were omitted for each country.

12.4 Results

In this section, we present the results for each of the two research questions. In the first part, we inspect the trend development for different groups of students based on gender, home background and immigrant status (RQ1). In part two, we compare the reading results from PISA 2018 in the new and old formats: dynamic items vs. static items and multiple vs. single texts (RQ2).

12.4.1 Main Trends for Groups: Gender Differences Controlled for SES

Girls outperformed boys in all three countries and for the OECD average in all PISA cycles. This is the case in most participating countries. In the first PISA survey in 2000, the socioeconomic index (HISEI) had a similar association with performance in reading literacy in the three countries when gender was accounted for. As seen in Table 12.3, Norway has a slightly smaller β -value (0.28) than Denmark and Sweden. Girls performed better than boys in all three countries, but the disadvantage to boys was smaller in Denmark ($\beta = -0.14$).

In PISA 2009, the socioeconomic indexes (HISEI in 2000 and ESCS in 2009 and 2018) had a larger association with the reading results in Denmark and Sweden than in PISA 2000 when gender was accounted for. In Norway and Denmark, the negative effect of being a boy increased compared with in 2000. However, the association between SES and reading performance decreased in all three countries in 2018 compared with 2009 when gender was accounted for (see Table 12.3). Moreover, the disadvantage for boys when SES is accounted for also decreased in 2018 compared with 2009 (see Fig. 12.2).

Table 12.3 Regression analysis with plausible values in reading as the dependent variable, PISA 2000, 2009 and 2018

		Constant	SES B	SES β	Boy B	Boy β	R ²
2000	Denmark	424.95	1.82	0.31	-25.62	-0.14	0.11
	Norway	430.94	1.85	0.28	-43.53	-0.21	0.12
	Sweden	450.79	1.72	0.31	-38.01	-0.21	0.13
2009	Denmark	500.09	36.65	0.38	-29.81	-0.18	0.18
	Norway	511.62	37.20	0.30	-49.21	-0.27	0.16
	Sweden	507.82	43.74	0.37	-45.12	-0.23	0.19
2018	Denmark	497.04	37.90	0.31	-28.78	-0.16	0.12
	Norway	505.75	35.14	0.27	-46.09	-0.22	0.12
	Sweden	510.47	38.76	0.33	-31.59	-0.15	0.13

Note: All coefficients are statistically significant at $p < .05$

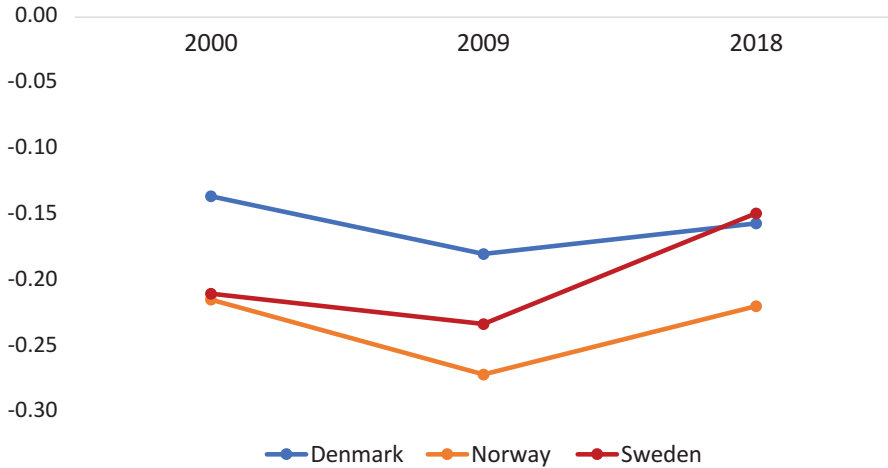


Fig. 12.2 The standardised b value (β) for the effect of gender (negative effect for boys) on reading performance when SES is accounted for

12.4.2 Main Trends for Groups: Language Background

Denmark, Norway and Sweden have students with a first language that differ from the language tested in the PISA reading assessment. Because linguistic comprehension skills such as vocabulary and grammar are closely associated with reading comprehension, the performance gap between language groups could be an indicator of equity. To investigate how the three school systems support the development of reading literacy in Danish, Norwegian and Swedish, we looked further into students with a majority background (native students) and minority background (first- and second-generation students).

In Fig. 12.3, there is a large performance gap between the majority and minority students in 2000, 2009 and 2018. This gap is larger in Sweden in 2018 compared with Norway and Denmark, and it is larger than the previous gaps in Sweden. There is a need for a cautionary note here because of the small sample of minority students in the Norwegian and Swedish samples. Denmark, however, oversampled minority students (first and second generation) in 2009 and 2018 and obtained a sample large enough to generalise from.

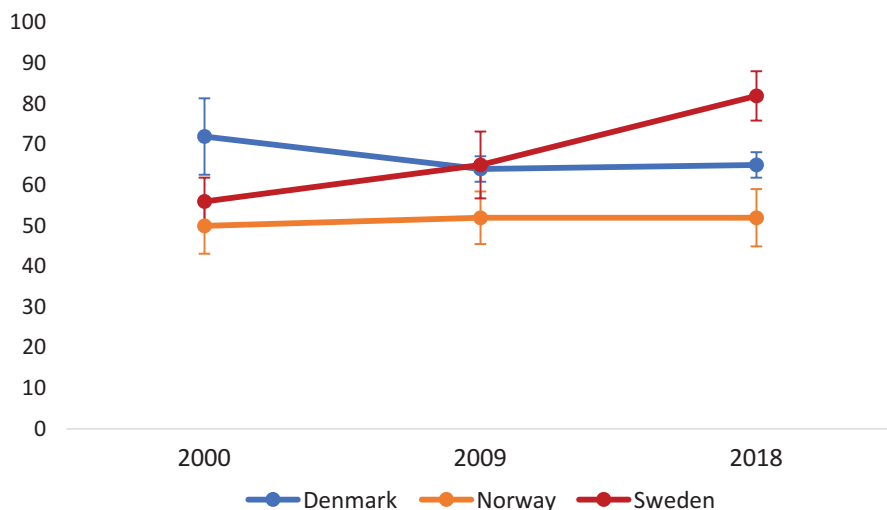


Fig. 12.3 The difference between majority and minority students' reading performance in PISA 2000, 2009 and 2018. Confidence interval (95%): Difference $\pm 1.96 * S.E$

12.4.3 Main Trends for Groups: Minority Students from Underprivileged Backgrounds

Being a minority student in Scandinavian countries often covaries with low socioeconomic background. Many of the newly arrived immigrants have few home possessions, and their parents have not yet entered the workforce. Even if the relationship between both home background and performance and language background and performance is fairly stable, there are still many students with socioeconomically disadvantaged backgrounds who succeed in school (Masten, 2018). Some students from lower SES homes and with non-native language backgrounds are among the middle and top performers. These students are commonly labelled academically resilient because they are successful in school despite being situated in an environment linked to poorer outcomes (Martin & Marsh, 2006). Figure 12.4 shows the average reading performance for minority students in the bottom quarter of SES.

Figure 12.4 indicates that in PISA 2000, the Swedish minority students in the bottom quarter of SES had the highest reading performance among the three countries but dropped to having the lowest performance in 2018. Even though the only statistically significant difference is between the Danish and Swedish students in 2000, in all three countries, there are differences between years. Danish students have a higher average in PISA 2018, while Norway has had the most stable trend. Annex B shows the proportion of minority students in the lowest SES quarter in PISA 2000, 2009 and 2018.

When comparing the β -values for minority students in Table 12.4, the negative effect on reading performance has been stable in PISA 2000, 2009 and 2018 ($\beta =$

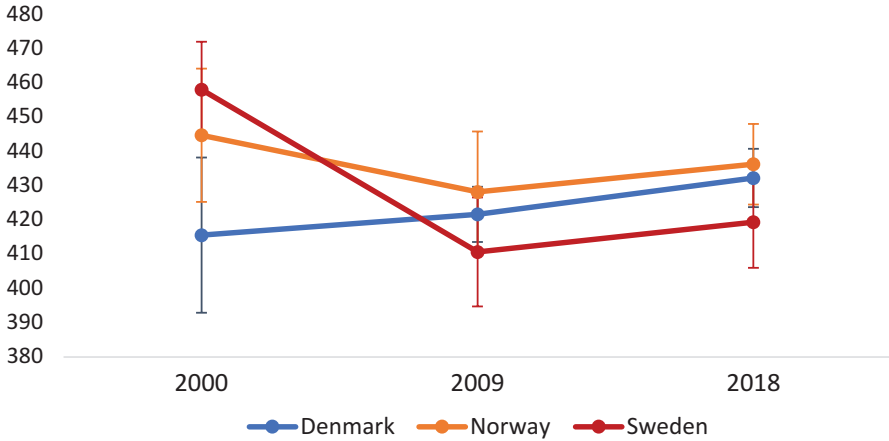


Fig. 12.4 Average reading performance for minority students, bottom quarter of SES. Confidence interval (95%): Difference $\pm 1.96 * S.E$

Table 12.4 Regression analyses of the effect of minority background on reading performance when SES is accounted for in all three countries in PISA 2000, 2009 and 2018

		2000		2009		2018	
		B	β	B	β	B	β
Denmark	Constant	418.95		489.63		489.83	
	SES	1.77	0.30	33.68	0.35	33.21	0.28
	Minority	-55.95	-0.15	-35.75	-0.12	-40.63	-0.14
	R ²	0.12		0.16		0.12	
Norway	Constant	413.91		490.70		489.28	
	SES	1.80	0.27	34.01	0.28	32.19	0.25
	Minority	-35.13	-0.08	-32.87	-0.09	-31.51	-0.10
	R ²	0.08		0.09		0.09	
Sweden	Constant	441.22		491.70		511.13	
	SES	1.63	0.29	39.84	0.34	30.68	0.26
	Minority	-42.07	-0.14	-39.95	-0.13	-61.22	-0.23
	R ²	0.11		0.15		0.16	

Note: All coefficients are statistically significant at $p < .05$

0.08–0.15). The exception was Sweden in PISA 2018, where the disadvantage for minority students increased dramatically. In Norway, the gap between majority and minority students is smaller compared with Denmark and Sweden in all three PISA surveys. The explained variance (R^2) in the models differs among the countries. The three regression models for Norway have a lower level of explained variance; thus, SES and minority background have a smaller influence on students’ performance in reading than in Denmark and Sweden. The results for Denmark in 2000, Norway (all years) and Sweden (all years) must be interpreted with caution because of the small sample sizes of minority students.

12.4.4 *Text Effect: Student Diversity When Reading Dynamic or Multiple Texts*

To answer our second research question, we conducted a number of analyses of the effect of dynamic/static and multiple/single texts on students' reading performance and of the differences between groups.

To investigate the possible difference between items with static texts compared with items with dynamic texts in PISA 2018, the average proportion of correct answered items was calculated. No clear pattern was evident. The static and dynamic items were correctly answered by approximately the same share of students in all three countries (see Table 12.5).

We also compared the equated proportion of correctly answered items with single and multiple texts. The multiple text items and the single text items were answered correctly to the same degree in all three countries (see Table 12.6). However, when we computed the average performance using the plausible values for girls and boys, it became evident that the boys performed particularly well on multiple items (Fig. 12.5). In Norway, the girls stood out because they performed almost equally well on the two item types. In all three countries, the boys showed a larger margin than the girls between their performance on multiple and single items.

We also compared students' performance on items with single and multiple texts. The students performed slightly better on multiple text items than on single text items in all three countries, with the biggest difference being found in Sweden. The Swedish students performed better than the Norwegian and Danish students and better than the OECD average (see Table 12.6). Figure 12.5 shows that the Swedish boys performed particularly well on the multiple items. In Norway, the girls stood out because they performed almost equally well on the two item types. In all three countries, the boys showed a larger margin than the girls between their performance on multiple items and on single items.

When SES is accounted for in the analysis of gender differences for multiple and single texts, the difference shown in Fig. 12.5 remains. The gender gap was found to be smaller for multiple texts than for single texts in all three countries. In other words, the boys' disadvantage is smaller for multiple texts than for single texts when SES is accounted for (see Table 12.7).

As Table 12.7 shows, boys performed better on multiple texts than single texts when SES was accounted for.

Table 12.5 Average equated proportion of correct answered static and dynamic items in PISA 2018

	Static (n=86)	SD	Dynamic (n=70)	SD	Diff.	S.E.
DNK	0.656	0.20	0.658	0.18	0.002	0.03
NOR	0.641	0.18	0.645	0.18	0.004	0.029
SWE	0.653	0.19	0.65	0.18	-0.003	0.029

Note: No significant differences between the static and dynamic texts

Table 12.6 Average equated proportion of correct answered items (P-values) and plausible values for single and multiple text items in PISA 2018 (see also e.g. OECD, 2019b)

	Single items				Multiple items			
	P-value (n=61)	SD	Plausible values	S.E.	P-value (n= 95)	SD	Plausible values	S.E.
DNK	0.644	0.19	496	2	0.665	0.19	503	1.8
NOR	0.638	0.18	498	2.4	0.645	0.18	502	2.3
SWE	0.648	0.18	503	3.1	0.655	0.18	511	3.1

Note: No significant differences between the single and multiple items

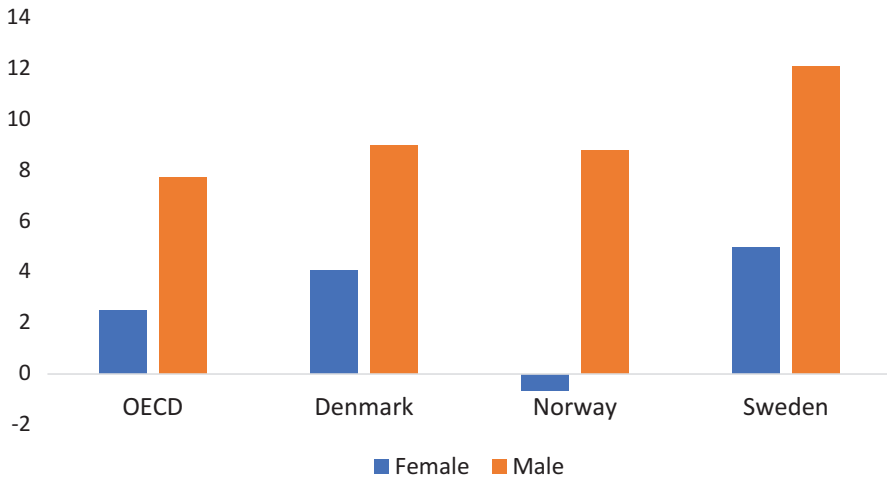


Fig. 12.5 Difference in reading performance between multiple and single texts by gender in PISA 2018

12.4.5 Text Effect: Students' Coping Strategies Through Task Omission

To give nuance to the analyses, we also analysed the students' omission of tasks. We consider omission as a strategy the students applied to cope with hard items, which is somewhat opposite of strategic flexibility. A larger percentage of the dynamic items than the static items are omitted in all three countries, and the same is true for the tasks connected to multiple texts (see Fig. 12.6). However, the performance was higher on multiple items than on single items in all three countries, despite the larger share of omitted multiple items.

A larger percentage of dynamic items than static items are omitted in all three countries, and this is the case for both single and multiple items. However, the results for single dynamic items should be interpreted with caution because they only include four items.

Table 12.7 Separate regression analysis of gender differences for multiple and single texts when SES is accounted for in PISA 2018

		Single		Multiple	
		B	β	B	β
Denmark	Constant	492.6		497.5	
	SES	40.0	0.32	38.4	0.32
	Boys	-31.8	-0.17	-26.7	-0.14
	R ²	0.13		0.12	
Norway	Constant	504.9		505.3	
	SES	37.8	0.29	35.0	0.27
	Boys	-49.7	-0.23	-40.1	-0.19
	R ²	0.13		0.11	
Sweden	Constant	508.3		513.4	
	SES	39.2	0.33	39.0	0.32
	Boys	-33.6	-0.16	-26.5	-0.12
	R ²	0.14		0.12	

Note. All coefficients are statistically significant $p < .05$

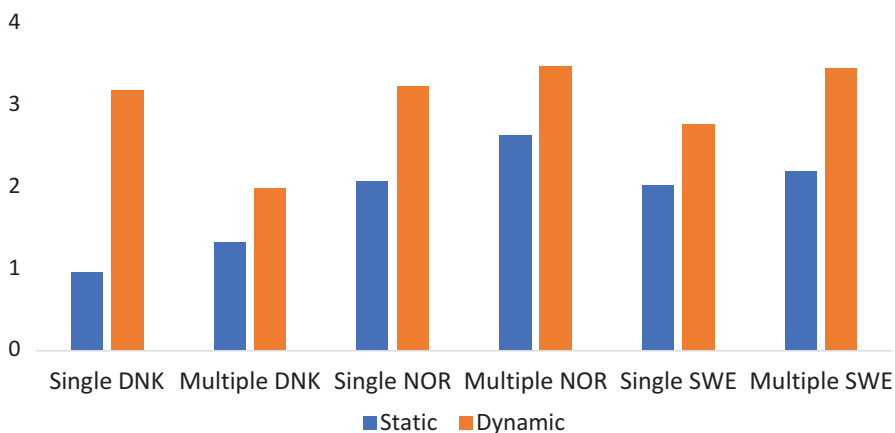


Fig. 12.6 Average percent omitted static/dynamic and multiple/single text items. Annex C also describes the percentage of omitted items

12.5 Discussion

There are four main findings that we want to highlight. First, we found a consistently high reading literacy performance in all the Scandinavian countries compared with international development although the Swedish trend between PISA 2000 and 2018 is slightly negative. Second, there are large gender differences in the average reading performance in all three countries, and in PISA 2018, the difference disfavoring boys is particularly large in Norway. Third, there is a huge and stable gap between minority and majority students’ reading achievement, even when

correcting for SES. There has been a marked development in Sweden, with distinctly weaker reading results for this group of students in PISA 2018. Thus, the effect of home background is similar, and there is no reason to conclude that the school systems give more equitable learning conditions for groups of students now than when the PISA assessments started. However, fourth, it appears that the new online text formats might shrink the differences between student groups; albeit, at the same time, we also see a larger proportion of students skipping these items.

12.5.1 Equity and Reading Literacy Opportunities

There is reason to positively interpret the stable trend of Scandinavian students' reading skills since 2000. Indeed, the pervasive digitisation of society has given students' reading interest completely different preconditions than for previous generations. In addition, the trend in many participating OECD countries and the international average in PISA have had a negative trend throughout the same period. The decline in the international average still applies, even if we focus on the 27 original OECD countries that participated in PISA 2000 and in all subsequent cycles (Jensen et al., 2020). PISA 2018 also indicates that reading interest and habits have dropped dramatically during this period, and here, it is remarkable that the reading results have not fallen in line with this (OECD, 2019b). The most obvious theory as to why the Scandinavian countries have managed to achieve stable results is that high-quality reading instruction is given at school. However, as the results also show, the measures taken to ensure high-quality education do not seem to affect all students.

Even though Imsen et al. (2017) found that all three countries have had a comparable educational development emphasising learning outcomes, assessment and accountability, there is also reason to emphasise the renewed weight on embedded literacy education. We found common traits among the educational initiatives in Denmark, Sweden and Norway, where reading and writing instruction are integrated in the school subjects and are supported by pervasive implementation in the literacy practices of teachers and schools. We have identified various educational initiatives aimed at embedded literacy, such as literacy-based curriculum reforms; the introduction of standardised and validated tests and mapping tools for formative assessment; early efforts to identify students at risk; reading campaigns for engagement; and the widespread use of reading counsellors. We cautiously conclude that all these measures are probably related to the stable and high reading performances and that there is good reading education in Scandinavia. However, there are nuances. Both Denmark and Norway initiated earlier and similar measures, while Sweden had curriculum reforms at a later stage and to a lesser extent. The Swedish in-service training programme in literacy for teachers, *Läsllyftet*, is unique in the Scandinavian context, but as an evaluation has shown (Skolverket, 2020), it is not considered sufficient in terms of being a rigorous implementation ensuring comparable effects across schools and municipalities.

From an equity perspective, this positive general picture of reading literacy in the Scandinavian countries is being nuanced when considering and comparing the

reading performance of majority and minority students. When it comes to the performance gap between majority and minority students in PISA 2018, Sweden stands out by having the lowest minority performance and a larger gap compared with Norway and Denmark. In Norway, the gap between majority and minority students is smaller compared with Denmark and Sweden in all three PISA surveys. The regression analyses also show that being a minority student has a stable negative effect on reading performance, except in Sweden in PISA 2018, where we find a dramatically larger disadvantage for minority students. There is a remarkably small gap between the groups of students in Norway that is stable over time. Even though the sample sizes are small, there is reason to put weight on these findings. Thus, the results of our study show that equity related to language background has not improved in any of the three countries between 2000 and 2018; they also indicate that Norway is doing markedly better than Sweden and Denmark, while in the case of Sweden, they indicate a weakening tendency regarding equity, which should raise concern.

Another factor to consider when discussing underprivileged minority groups is the size and composition of the countries' minority populations. In this respect, Sweden differs from the other countries. In Sweden, there has been a stepwise increase in immigration, with an especially high number of immigrants starting in 2013 (Swedish Migration Agency, 2020). Even though the same general movement can be found in Denmark and Norway, with a steady rise of immigrants peaking after the crisis in 2015 (Statistics Denmark, 2020; Statistics Norway, 2020), it is far from proportional to the rise in Sweden. Sweden also has the highest number of humanitarian migrants in the 2009–2018 period, while Denmark and Norway have a higher proportion of immigrant workers. In all OECD countries, humanitarian migrants have difficult integration processes (OECD, 2015). However, the number of immigrants or the different reasons for migration cannot be treated as a matter of equity. With a considerable number of newly arrived immigrants in all three countries, the crucial question is as follows: How do the systems compensate for these underprivileged students in school?

In all three countries, newly arrived students are typically enrolled in school introduction programmes, most commonly after some time and after obtaining a residence permit. Most of these student programmes last for up to 2 years and have intensive language training. In Sweden, the introduction programme is decentralised and differs between the municipalities; newly arrived students are sometimes placed in an ordinary class and sometimes in preparation classes.

As pointed out above, Norway stands out as having a higher degree of equity in reading performance regarding language background. A possible contributing cause for this, we argue, could be that Norway remains most in line with the traditional Nordic model of schooling. As touched on briefly in the introduction, Lundahl concluded that it is highly doubtful whether one can still speak of a Nordic model of education when considering the development in Sweden from the perspective of extensive marketisation and privatisation practices (2016, p. 9). Likewise, Klette (2018) discussed how the emergence of new models of individualism and competition in both private and public schools in the Nordic countries pose a challenge to

education as a foundation for a cooperative and fair society. She found that although all the Scandinavian countries have a strong decentralisation of school governance, there are some differences (2018, p. 67). Denmark and Sweden stand out by having free choice of schools, while this is only possible in some municipalities in Norway. In both countries, this leads to educational segregation because many students enrol in private schools rather than in local neighbourhood schools. Norway, by contrast, has eschewed this tendency towards increased educational segregation and, thus, remains most in line with the traditional Nordic model of schooling. It is not unlikely that having less educational segregation could be part of the reason why Norway has a higher degree of equity in reading performance between majority and minority students. Further studies are needed to examine this hypothesis.

12.5.2 Equitable New Reading Challenges?

To answer our second research question, we compared students' performance when reading traditional texts in PISA 2018 with their reading of dynamic and multiple texts. We did not find any average performance difference between dynamic and static texts in any of the three countries. However, the students performed slightly better on multiple text items than on single text items. We found the greatest performance difference between the text types in Sweden, where the students performed better on the multiple items than Norwegian and Danish students and the OECD average. The gender differences were smaller for multiple texts than for single texts in all three countries when SES was accounted for, and boys were less disadvantaged when reading texts in new formats. Thus, our results indicate that the new digital formats strengthen equity in reading performance, reducing the gender difference between boys and girls, which has been a constant throughout all PISA surveys. Please note that we have not investigated differences between reading on paper or screen, only reading different genres on screen. However, although reading in new formats seems to give more equitable conditions, students' completion of tasks varied considerably. We treated student omission of items as a student strategy for coping with hard items, and in all three countries, a larger percentage of the dynamic items and multiple items were omitted compared with the static and multiple items, respectively.

Indeed, the impact of SES weakens in online reading and digital competence compared with traditional reading proficiency studies (Frønes & Narvhus, 2011; Olsen et al., 2015; Rasmussen, 2016), and our findings confirm this. However, why does reading online texts in new formats place students in a more equitable learning situation? Most commonly, discussions centre around access to computers and the Internet, how often and for what purpose students use the devices and their engagement with online text types.

Most students in Scandinavian countries have access to these new forms of reading material. In Norway and Denmark, access to computers and the Internet in schools has been a strong political priority for over two decades. PISA 2009 showed

that access to both PCs and the Internet was at a very high level in Norway and Denmark—the highest in an international context—without this being crucial to how students performed on the online reading test (Frønes & Narvhus, 2011; Mejding, 2011). Even though deploying computers in Swedish schools occurred later, by 2018, the coverage in both homes and schools was reported to be at a comparable level. In the same way, there is no reason to expect huge differences between students' use of computers either at school or at home. Studies have shown that students have similar leisure uses of computers and use computers relatively little for school work (Bundsgaard & Gerick, 2017; Frønes & Narvhus, 2011; Mejding, 2011). Here, the Scandinavian countries can be characterised by very little variance: several studies confirm that 'everyone' has access to the Internet, that 'everyone' performs the same activities and that the background variables have little power to describe the differences between students (Egeberg, Hultin, & Berge, 2016; Rohatgi & Throndsen, 2015). However, the relation between reading online texts and reading activities may be more complex than indicated here because of imprecise measuring instruments. Also, access is not a reliable predictor of teachers' actual implementation of digital technology (Gil-Flores, Rodríguez-Santero, & Torres-Gordillo, 2017).

Previously, we have substantiated that reading online dynamic texts and/or multiple texts is more demanding for readers. How is it, then, that more students perform at a higher level when encountering these texts? We covered the reasons that might explain why many students are experienced in these new text formats: most adolescents in the Scandinavian countries live digital lives. The new text formats might also give opportunities to learn for a broader group of students. Many students report a higher motivation for reading online texts (OECD, 2019b) and boys have been shown to have an advantage over girls in specific aspects of the comprehension of online texts and hypertexts (Rasmusson & Åberg-Bengtsson, 2015). The reason for this may be that boys have developed their visuo-spatial abilities more than girls, a benefit from playing computer games.

On the other hand, this might be a too optimistic position when considering the educational context for online reading. Several studies have shown that online reading comprehension and strategies are seldom taught at school, even though it is a part of the curriculum in language arts and other subjects (Blikstad-Balas & Klette, 2020). Both Norway and Denmark were among the first in the world to integrate digital skills in the national curriculums but did not emphasise online reading when doing so. There is also a larger between-school variation in online reading performance than in traditional reading tests, which might be explained by decentralised and personalised teaching practices and a discrepancy between access and teachers' preparedness to use the technology in teaching (Carlsten, Caspersen, Vibe, & Aamodt, 2014; Gudmundsdottir & Ottestad, 2016; Throndsen, Carlsten, & Björnsson, 2019). It seems as if the development of the students' online reading skills is largely left to their own literacy practices.

Researchers have agreed that there is a need for specialised strategies when reading online (Afflerbach & Cho, 2009; Coiro, 2011), and these strategy areas—text construction, managing working memory and self-regulation—need to be explicitly

taught to students. Reading dynamic or multiple texts online is especially challenging for students with few reading strategies in their repertoire or with fewer effective strategies. According to Cho (2014), expert readers in an online environment conduct several continuous and parallel reading activities when constructing reading paths, comprehending multiple texts and evaluating and judging the relevance, trustworthiness and usefulness of texts. This description mimics the reading challenges in PISA 2018, which tended to be so hard that many students omitted them. For these students, more explicit instruction in reading digital and online texts is required to ensure that the equity potential shown to be linked to digital text formats is realised.

12.6 Closing Remarks

We emphasise that the findings that give cause for concern are the trends among minority readers from underprivileged homes and the large gender differences. Although Scandinavian reading performance is high, there are many signs that reading education is not as equitable as it should be. In all countries, school policies state that the educational system needs to prioritise the compensatory aim with schooling. However, our analyses confirm Lundahl's claim (2016) that it is highly doubtful if one can still speak of a Nordic model of education, both as an idea of equity and fairness and in the lack of unity across countries because of the development of low-SES students and students with a minority background in Sweden.

However, there is reason to believe that new initiatives and reforms may come. In Norway, the dropout rate for boys in many areas has been investigated by the Stoltenberg Committee (NOU, 2019, p. 3), which has led to discussions on boys' underprivileged position, especially those from low-SES homes or minority backgrounds. In Sweden, a public inquiry has proposed a number of measures to revise the free schooling development to ensure more equal schools and reduced school segregation (SOU, 2020, p. 28). In Denmark, Sweden and Norway, we see an increasing awareness in the academic and policy level of the need for informed didactics for reading instruction in new text formats. A necessary alignment of curriculum, teacher training and teaching practices might open up new equitable opportunities for learning and, hopefully, remove a gatekeeper for participation in our text-based, digitised society.

Appendix

Annex A

Majority and minority students' reading performance in 2000, 2009, and 2012 in Denmark, Norway and Sweden.

		Majority		Minority		Ma-Mi
		Average	S.E.	Average	S.E.	
2018	Denmark	509	1.9	444	3.5	65
	Norway	509	2.1	457	5.7	52
	Sweden	525	2.7	443	5.8	82
2009	Denmark	502	2.2	438	3.8	64
	Norway	508	2.6	456	5.9	52
	Sweden	507	2.7	442	6.9	65
2000	Denmark	504	2.2	432	7.0	72
	Norway	510	2.8	460	6.3	50
	Sweden	524	2.1	467	5.1	56

Annex B

Percent minority students among the bottom SES-students in Denmark, Norway and Sweden.

	2000	2009	2018
Denmark	10.95	18.23	23.95
Norway	7.52	13.52	23.13
Sweden	15.29	21.48	36.79

Annex C

Average equated proportion omitted static/dynamic and multiple/single text items in PISA 2018, in Denmark (DNK), Norway (NOR) and Sweden (SWE).

	Denmark		Norway		Sweden	
	Single	Multiple	Single	Multiple	Single	Multiple
<i>Static</i>						
n items	57	29	57	29	57	29
Mean	0.96	1.33	2.07	2.64	2.02	2.2
Std. dev.	1.07	2.05	1.79	2.78	2.15	2.26
<i>Dynamic</i>						
n items	4	66	4	66	4	66
Mean	3.19	1.99	3.24	3.48	2.78	3.46
Std. dev.	4.84	3.2	3.73	5.12	2.86	4.97

Annex D

Majority and minority students' reading performance in 2000, 2009, and 2012.

		Majority		Minority		Ma-Mi
		Average	S.E.	Average	S.E.	
2018	Denmark	509	1.9	444	3.5	65
	Norway	509	2.1	457	5.7	52
	Sweden	525	2.7	443	5.8	82
2009	Denmark	502	2.2	438	3.8	64
	Norway	508	2.6	456	5.9	52
	Sweden	507	2.7	442	6.9	65
2000	Denmark	504	2.2	432	7.0	72
	Norway	510	2.8	460	6.3	50
	Sweden	524	2.1	467	5.1	56

References

- Aasen, P., Møller, J., Rye, E., Ottesen, E., Prøitz, T. S., & Hertzberg, F. (2012). *Kunnskapsløftet som styringsreform—et løft eller et løfte? Forvaltningsnivåenes og institusjonenes rolle i implementeringen av reformen* [The knowledge leap as a management reform – A leap or a promise? The role of the institutions and the different levels of management regarding the implementation of the reform] (NIFU-rapport 20/2012). NIFU & ILS, UiO.

- Afferbach, P., & Cho, B.-Y. (2009). Identifying and describing constructively responsive comprehension strategies in new and traditional forms of reading. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 69–90). New York: Routledge.
- Andersen, A. M., Egelund, N., Jensen, T. P., Krone, M., Lindenskov, L., & Mejding, J. (2001). *Forventninger og færdigheder—danske unge i en international sammenligning* [Expectations and skills – Danish youngsters in an international comparison]. Socialforskningsinstituttet.
- Antunes, F. (2012). ‘Tuning’ education for the market in Europe? Qualifications, competences and learning outcomes: Reform and action on the shop floor. *European Educational Research Journal*, 11(3), 446–470. <https://doi.org/10.2304/eej.2012.11.3.446>
- Berge, K. L. (2005). Skrivning som grunnleggende ferdighet og som nasjonal prøve—ideologi og strategier [Writing as a basic skill and as national test—Ideology and strategies]. In A. J. Aasen & S. Nome (Eds.), *Det nye norskfaget* (pp. 161–188). Bergen, Norway: Fagbokforlaget.
- Beuchert, L., & Christensen, V. (2019). Læsning og indvandrerbaggrund [Reading literacy and migrant background]. In V. T. Christensen (Ed.), *PISA 2018 – Danske unge i en international sammenligning* (pp. 178–207). Copenhagen: VIVE.
- Blikstad-Balas, M., & Klette, K. (2020). Still a long way to go. Narrow and transmissive use of technology in the classroom. *Nordic Journal of Digital Literacy*, 15(1), 55–68. <https://doi.org/10.18261/issn.1891-943x-2020-01-05>
- Blossing, U., Imsen, G., & Moos, L. (2014). Nordic schools in a time of change. In U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic education model. A “school for all” encounters neo-liberal policy* (pp. 1–14). Dordrecht, The Netherlands: Springer.
- Bråten, I., Britt, M. A., Strømsø, H. I. & Rouet, J.-F. (2011). The role of epistemic beliefs in the comprehension of multiple expository texts: Toward an integrated model. *Educational Psychologist*, 46(1), 48–70. <https://doi.org/10.1080/00461520.2011.538647>
- Braun, H., & von Davier, M. (2017). The use of test scores from large-scale assessment surveys: Psychometric and statistical considerations. *Large-scale Assessments in Education*, 5, 17. <https://doi.org/10.1186/s40536-017-0050-x>
- Bremholm, J., & Bundsgaard, J. (2019). Læsning i PISA 2018 [Reading literacy in PISA 2018]. In V. T. Christensen (Ed.), *PISA 2018 – Danske unge i en international sammenligning* (pp. 18–69). Copenhagen: VIVE.
- Bundsgaard, J., & Gerick, J. (2017). Patterns of students’ computer use and relations to their computer and information literacy: Results of a latent class analysis and implications for teaching and learning. *Large-scale Assessment in Education*, 5, 16. <https://doi.org/10.1186/s40536-017-0052-8>
- Carlbaum, S., Andersson, E., & Hanberger, A. (2016). *Utværdering av Läslyftet. Delrapport 2: Erfarenheter av Läslyftet läsåret 2015/16* [Evaluation of Läslyftet. Report 2: Experiences with Läslyftet in the year 2015/16]. Umeå Centre for Evaluation Research.
- Carlsten, T. C., Caspersen, J., Vibe, N., & Aamodt, P. O. (2014). *Resultater fra TALIS 2013. Norske funn fra ungdomstrinnet i internasjonalt lys, Arbeidsnotat 10/2014* [Results from TALIS 2013. Norwegian results from 8th to 10th grade in international comparison]. NIFU.
- Cho, B.-Y. (2014). Competent adolescent readers’ use of internet reading strategies: A think-aloud study. *Cognition and Instruction*, 32(3), 253–289. <https://doi.org/10.1080/07370008.2014.918133>
- Coiro, J. (2003). Exploring literacy on the Internet. Reading comprehension on the Internet: Expanding our understanding of reading comprehension to encompass new literacies. *The Reading Teacher*, 56(5), 458–464.
- Coiro, J. (2011). Predicting reading comprehension on the Internet. *Journal of Literacy Research*, 43(4), 352–392. <https://doi.org/10.1177/1086296X11421979>
- Egeberg, G., Hultin, H., & Berge, O. (2016). *Monitor skole 2016. Skolens digitale tilstand* [The monitor school 2016. The digital condition of the school]. Senter for IKT i utdanningen.
- Egelund, N. (Ed.) (2010). *PISA 2009 – Danske unge i en international sammenligning* [PISA 2009 – Danish youngsters in an international comparison]. Danmarks Pædagogiske Universitets-skole.

- Espinoza, O. (2007). Solving the equity—Equality conceptual dilemma: A new model for analysis of the educational process. *Educational Research*, 49(4), 343–363.
- ETS. (2019). *Computation of equated proportion correct for PISA MSAT and evaluation of the 2015 and 2018 MS reading results* (Unpublished manuscript).
- EVA, Danmarks Evalueringsinstitut. (2009). *Særlige ressourcpersoner i folkeskolen* [Specialized personnel in the public school]. Rapport. Danmarks Evalueringsinstitut.
- Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). The influence of students' personal and home background on computer and information literacy. In J. Fraillon, J. Ainley, W. Schulz, T. Friedman, & E. Gebhardt (Eds.), *Preparing for life in a digital age* (pp. 101–124). Cham, Switzerland: Springer. https://doi.org/10.1007/978-3-319-14222-7_5
- Frønes, T. S., & Narvhus, E. K. (2011). *Elever på nett. Digital lesing i PISA 2009* [Students on the web. Digital reading in PISA 2009]. Institutt for lærerutdanning og skoleforskning, Universitetet i Oslo.
- Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J.-J. (2017). Factors that explain the use of ICT in secondary-education classrooms: The role of teacher characteristics and school infrastructure. *Computers in Human Behavior*, 68, 441–449. <https://doi.org/10.1016/j.chb.2016.11.057>
- Gudmundsdottir, G. B., & Ottestad, G. (2016). På vei mot profesjonsfaglig digital kompetanse [Towards digital competence in the educational professions]. In R. J. Krumsvik (Ed.), *Digital læring i skole og lærerutdanning* (pp. 70–82). Oslo, Norway: Universitetsforlaget.
- Hodgson, J., Rønning, W., Skogvold, A. S., & Tomlinson, P. (2010). *På vei fra læreplan til klasse-rom: Om læreres fortolkning, planlegging og syn paa LK06. Report*. [From curriculum to classroom: Teachers' interpretations, planning and view of LK06]. Nordland Research Institute.
- Imsen, G., Blossing, U., & Moos, L. (2017). Reshaping the Nordic education model in an era of efficiency. Changes in the comprehensive school project in Denmark, Norway, and Sweden since the millennium. *Scandinavian Journal of Educational Research*, 61(5), 568–583. <https://doi.org/10.1080/00313831.2016.1172502>
- Jensen, F., Frønes, T. S., Kjærnsli, M., & Roe, A. (2020). Norske elevers leseforståelse i PISA 2000–2018 [Norwegian students' reading comprehension in PISA 2000–2018]. In T. S. Frønes & F. Jensen (Eds.), *Like muligheter til god leseforståelse? Lesing i PISA i et 20-års perspektiv*. Oslo: Universitetsforlaget.
- Kiili, C., Laurinen, L., & Marttunen, M. (2008). Students evaluating internet sources—From versatile evaluators to uncritical readers. *Journal of Educational Computing Research*, 39(1), 75–95.
- Klette, K. (2018). Individualism and collectivism in Nordic schools. A comparative approach. In N. Witoszek & A. Midttun (Eds.), *Sustainable modernity: The Nordic model and beyond* (pp. 59–79). London: Routledge.
- Kuhlman, J., & Rydén, M.M. (2011). *Er der en læsevejleder på denne skole? En kvalitativ undersøgelse af muligheder og modstande i læsevejlederfunktionen. Report* [Is there a reading counselor at this school? A qualitative study of the possibilities and barriers of having reading counselors at schools]. Nationalt Videncenter for Læsning.
- Lawless, K. A. & Kulikowich, J. M. (1996). Understanding hypertext navigation through cluster analysis. *Journal of Educational Computing Research*, 14(4), 385–399. <https://doi.org/10.2190/DVAPDE23-3XMV-9MXH>
- Lie, S., Kjærnsli, M., Roe, A., & Turmo, A. (2001). *Godt rustet for framtida? Norske 15-åringers kompetanse i lesing og realfag i et internasjonalt perspektiv* [Well prepared for the future? Norwegian 15-year-old students' competences in reading and science in an international perspective]. *Acta Didactica*. Institutt for lærerutdanning og skoleutvikling, Universitetet i Oslo.
- Lundahl, L. (2016). Equality, inclusion and marketization of Nordic education: Introductory notes. *Research in Comparative and International Education*, 11(1), 3–12.
- Martin, A. J., & Marsh, H. W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools*, 43(3), 267–281.
- Masten, A. S. (2018). Resilience theory and research on children and families: Past, present, and promise. *Journal of Family Theory & Review*, 10, 12–31.

- Mejdning, J. (2011). *PISA 2009. Læsning af elektroniske tekster* [PISA 2009. Reading of digital texts]. DPU
- Mejdning, J. (2019). Test i historisk perspektiv. Hvorfor tester vi? [Tests in a historical perspective. Why do we test?]. *Viden om Literacy*, 25.
- Molander, B. O., Pettersson, A., Skarlind, A., & Taube, K. (2001). *PISA 2000: Svenska femtonåringars läsförmåga och kunnande i matematik och naturvetenskap i ett internationellt perspektiv* [PISA 2000: Swedish 15-year-old students' reading literacy and skills in mathematics and science in international perspective]. Skolverket.
- Moos, L. (2014). Educational governance in Denmark. *Leadership and Policy in Schools*, 13(4), 424–443. <https://doi.org/10.1080/15700763.2014.945655>
- NOU. (2019). *NOU 2019: 3. Nye sjanser—bedre læring*. Kjønnforskjeller i skoleprestasjoner og utdanningsløp [New opportunities—Better learning. Gender differences in school results and educational trajectories]. <https://nettsteder.regjeringen.no/stoltenbergutvalget>
- OECD. (2001). *Knowledge and skills for life. First results from the OECD Programme for International Student Assessment (PISA) 2000*. Paris: OECD.
- OECD. (2009). *PISA data analysis manual, SPSS®* (2nd ed.). Paris: OECD Publications.
- OECD. (2011). How are school systems adapting to increasing numbers of immigrant students? *PISA in FOCUS*, 11, 1–4.
- OECD. (2015). *Improving schools in Sweden: An OECD perspective*. Paris: OECD Publishing.
- OECD. (2019a). *PISA 2018 assessment and analytical framework*. Paris: OECD Publishing. <https://doi.org/10.1787/19963777>
- OECD. (2019b). *PISA 2018 results. What students know and can do* (Vol. I). Paris: OECD Publishing. <https://doi.org/10.1787/19963777>
- OECD. (2019c). *PISA 2018 results. Where all students can succeed*. Paris: OECD Publishing. <https://doi.org/10.1787/b5fd1b8f-en>
- OECD. (2020). *Scaling PISA data* (PISA 2018 Technical Report). OECD Publishing. <http://www.oecd.org/pisa/data/pisa2018technicalreport/Ch.09-Scaling-PISA-Data.pdf>
- Olsen, R. V., Hatlevik, O. E., & Loi, M. (2015). Digitale skiller [Digital divisions]. In O. E. Hatlevik & I. Thronsdén (Eds.), *Læring av IKT: Elevenes digitale ferdigheter og bruk av IKT i ICILS 2013* (pp. 146–170). Universitetsforlaget.
- Piacentini, M., & Pacileo, B. (2019). *How are PISA results related to adult life outcomes? PISA in Focus, No. 102*. Paris: OECD Publishing. <https://doi.org/10.1787/7b60595e-en>
- Rasmusson, M. (2016). A multilevel analysis of Swedish and Norwegian students' overall and digital reading performance with a focus on equity aspects of education. *Large-scale Assessments in Education*, 4(3), 1–25. <https://doi.org/10.1186/s40536-016-0021-7>
- Rasmusson, M., & Åberg-Bengtsson, L. (2015). Does performance in digital reading relate to computer game playing? A study of factor structure and gender patterns in 15-year-olds' reading literacy performance. *Scandinavian Journal of Educational Research*, 59(6), 691–709. <https://doi.org/10.1080/00313831.2014.965795>
- Roe, A. (2012). Ungdom og lesing—hva forteller nasjonale og internasjonale leseprøver? [Youth and reading—What do national and international reading assessments tell?]. In A. M. Bjorvand & E. S. Tønnessen (Eds.), *Den andre leseopplæringa. Utvikling av lesekompetanse hos barn og unge* (pp. 103–131). Oslo, Norway: Universitetsforlaget.
- Rohatgi, A., & Thronsdén, I. (2015). Elevenes IKT-bruk [The students use of ICT]. In O. E. Hatlevik & I. Thronsdén (red.), *Læring av IKT: Elevenes digitale ferdigheter og bruk av IKT i ICILS 2013* (pp. 93–110). Universitetsforlaget.
- Rutkowski, L., Gonzalez, E., von Davier, M., & Zhou, Y. (2014). Assessment design for international large-scale assessments. In L. Rutkowski, M. von Davier, & D. Rutkowski (Eds.), *Handbook of international large-scale assessment. Background, technical issues and methods of data analysis* (pp. 75–96). Boca Raton, FL: RC Press.
- Rutkowski, D., & Rutkowski, L. (2013). Measuring socioeconomic background in PISA: One size might not fit all. *Research in Comparative and International Education*, 8(3), 259–278. <https://doi.org/10.2304/rcie.2013.8.3.259>

- Rutkowski, L., & Rutkowski, D. (2017). Improving the comparability and local usefulness of international assessments: A look back and a way forward. *Scandinavian Journal of Educational Research*, 62(3), 354–367. <https://doi.org/10.1080/00313831.2016.1261044>. [13]
- Salmérón, L., Strømsø, H. I., Kammerer, Y., Stadler, M., & van den Broek, P. (2018). Comprehension processes in digital reading. In M. Barzillai, J. Thompson, S. Schroeder, & P. van den Broek (Eds.), *Learning to read in a digital world* (pp. 91–120). Amsterdam: John Benjamins Publishing Company.
- SFS 2010:800. (2010). *Skollag*. [The Swedish School Law]. Stockholm: Utbildningsdepartementet.
- Shapiro, A., & Niederhauser, D. (2004). Learning from hypertext: Research issues and findings. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 605–620). New York: Lawrence Erlbaum Associates.
- Sivesind, K., Akker, J. v. d., & Rosenmund, M. (2012). The European curriculum: Restructuring and renewal. *European Educational Research Journal*, 11, 320–327. <https://doi.org/10.2304/eerj.2012.11.3.320>
- Skolverket. (2020). *Utvärdering av Läsflyftet—Slutrapport* [Evaluation of Läsflyftet – Final report]. SOU. (2020). *En mer likvärdig skola—minskad skolsegregation och förbättrad resurstilldelning* [A more equal school – reduced segregation of schools and improved allocation of resources]. Regeringskansliet.
- Spiro, R. J., Feltovich, P. J., Jacobson, M. J., & Coulson, R. L. (1992). Cognitive flexibility, constructivism and hypertext: Random access instruction for advanced knowledge acquisition in ill-structured domains. In T. Duffy & D. Jonassen (Eds.), *Constructivism and the technology of instruction* (pp. 57–76). Hillsdale, NJ: Erlbaum.
- Spiro, R. J., Klautke, H., & Johnson, A. K. (2015). All bets are off: How certain kinds of reading to learn on the web are totally different from what we learned from research on traditional text comprehension and learning from text. In R. J. Spiro, M. DeSchryver, M. S. Hagerman, P. M. Morsink, & P. Thompson (Eds.), *Reading at a crossroads? Disjunctures and continuities in current conceptions and practices* (pp. 45–50). New York: Routledge.
- Statistics Denmark/DS. (2020). *Flytninger til og fra udlandet* [Relocations to and from abroad]. <https://www.dst.dk/da/Statistik/emner/befolkning-og-valg/flytninger/flytninger-til-og-fra-udlandet>
- Statistics Norway/SSB. (2020). *Innvandring og innvandrere* [Immigration and immigrants]. <https://www.ssb.no/innvandring-og-innvandrere>
- Støle, H., Mangen, A., Frønes, T. S., & Thomson, J. (2018). Digitisation of reading assessment. In M. Barzillai, J. Thompson, S. Schroeder, & P. van den Broek (Eds.), *Learning to read in a digital world* (pp. 205–224). Amsterdam: John Benjamins Publishing Company.
- Swedish Migration Agency. (2020). *Granted residence permits overviews*. <https://www.migrationsverket.se/English/About-the-Migration-Agency/Statistics/Granted-permits-overviews.html>
- Telhaug, A. O., Aasen, P., & Mediås, O. A. (2004). From collectivism to individualism? Education as nation building in a Scandinavian perspective. *Scandinavian Journal of Educational Research*, 48, 141–158. <https://doi.org/10.1080/0031383042000198558>
- Telhaug, A. O., Mediås, O. A., & Aasen, P. (2006). The Nordic model in education: Education as part of the political system in the last 50 years. *Scandinavian Journal of Educational Research*, 50, 245–283. <https://doi.org/10.1080/00313830600743274>
- Thronsdén, I., Carlsten, T. C., & Björnsson, J. K. (2019). *TALIS 2018—Første hovedfunn fra ungdomstrinnet* [TALIS 2018—The first major findings from 8th to 10th grade]. ILS/NIFU.
- UFD. (2003). *Gi rom for lesing! Strategi for stimulering av leselyst og leseferdighet 2003–2007* [Make room for reading! Strategy for the stimulation of reading competency and the joy of reading]. Utdannings- og forskningsdepartementet.
- UNESCO. (2004). *The plurality of literacy and its implications for policies and programmes*. Paris: United Nations Educational, Scientific and Cultural Organization.
- UVM [Undervisningsministeriet/Ministry of Education]. (2001). *Klare mål – Dansk* [National Curriculum – Danish as L1]. Undervisningsministeriet.

- UVM [Undervisningsministeriet/Ministry of Education]. (2009). *Fælles Mål – Dansk* [National Curriculum – Danish as L1]. Undervisningsministeriet.
- UVM [Undervisningsministeriet/Ministry of Education]. (2014). *Fælles Mål – Dansk* [National Curriculum – Danish as L1]. Undervisningsministeriet.
- Wylie, J., Thomson, J., Leppänen, P. H. T., Ackerman, R., Kanninen, L., & Prieler, T. (2018). Cognitive processes and digital reading. In M. Barzillai, J. Thompson, S. Schroeder, & P. van den Broek (Eds.), *Learning to read in a digital world* (pp. 57–90). Amsterdam: John Benjamins Publishing Company.

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