

# School achievement and health development in the Nordic countries

Knowledge gaps and concerns about  
school-age children



Nordic Welfare  
Centre

## **School achievement and health development in the Nordic countries**

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# Preface

Socio-economic differences in health have been a widely discussed topic for the last few decades. In the Nordic countries, education plays a particularly important role in explaining health outcomes. This report aims to highlight knowledge gaps and describe the need for research to better understand the connections between education, health, and equality.

A trend in the Nordic countries is that men, as a group, fall behind when it comes to educational achievement and health outcomes. The Norwegian report [Nye sjanser – bedre læring Kjønnsforskjeller i skoleprestasjoner og utdanningsløp](#), written by an expert committee led by the Director General for the Norwegian Institute of Public Health, Camilla Stoltenberg, shows that there are significant gender differences in educational achievement. At the end of elementary school (grundskolan), Norwegian girls have better grades than boys in all subjects except sports. There are also significant differences in the adult population when it comes to higher education. In Norway, 57 per cent of women aged 30–39 have a higher education; the corresponding rate for men is 40 per cent. A similar pattern can be found in all the Nordic countries.

Based on the findings in the Norwegian report, the Nordic research institution Nordforsk conducted the seminar [Myths and facts: Gender gaps in Nordic educational achievement](#) on 15 January 2020. The purpose of the seminar was to discuss the need for research on how gender differences in educational achievement will affect Nordic health, welfare, and working life in the future.

The main conclusions of this report were presented and discussed at the seminar, together with the findings from the Norwegian report 'Nye sjanser – bedre læring Kjønnsforskjeller i skoleprestasjoner og utdanningsløp'.

Due to the coronavirus pandemic, the plan for a Nordic research programme in the field of health, education, and equality was put on hold. However, the pandemic has not diminished the need for knowledge in this field, rather the opposite. At the Nordic Welfare Centre, we hope that this report will nurture the discussion in the post-pandemic era, which we hope is soon to come.

Stockholm, April 2021

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# Executive summary

School achievement has increasingly come into focus during the last decades. The overall aim of this report is to highlight the need for knowledge for promoting health and development among school-age children in the Nordic countries. Learning in school and for life is a key element for future well-being and quality of life.

This analysis did not have the resources nor time for a systematic review. Therefore, a more selective approach was taken based on previous reviews, and the report also partly serves as a scoping review. The different sections of the report conclude with a list of knowledge gaps and concerns.

The research methodologies in the relevant disciplinary fields are diverse. Different researchers also have different paradigms: not only do they differ in scientific approaches, but they also do not share basic assumptions, research procedures, and analytical methods. Therefore, an introductory section deals with this challenge. What is needed in this field is scientific knowledge as well as practical knowledge and practical wisdom to guide the further development of the school system.

The school systems in the Nordic countries are both similar and different. We can learn from each other's successes and failures, which merits a brief overview of the Nordic school systems. The school for all has been a joint characteristic of the Nordic school model, but it has been challenged by neoliberal policies such as school choice and privatisation.

School achievement is a major focus in this report. However, in order to do multi-country comparisons, the development of international large-scale assessments has been crucial as a research infrastructure. The report gives some recent results from the 2018 PISA study.

This study discusses mainly three different aspects of inequality in school achievement. (i) Gender differences in school achievement are a universal finding. Boys are falling behind girls. What do we know about this, what impact does it have, and what can we do to make a school where the children can grow and reach their full potential? (ii) Socioeconomic differences in school achievement are among the findings in most countries, and so also in the Nordic welfare states. This may seem paradoxical. (iii) Health development is also associated with school achievement. We have learnt from

longitudinal studies that there is a reciprocal relationship between mental health and learning.

The report discusses a series of concerns regarding methodology, theoretical perspective, policy aspects, and ethical and political aspects. There is a need for scientific knowledge, practical knowledge, and practical wisdom to guide the further development of the Nordic school systems. This can be achieved by bridging different knowledge gaps through studies of different educational practice, interventions, and measures; by using systematic reviews to summarise what is already known; by doing original comparative research; by using the potential of the unique infrastructure and competence in registry-based research as well as the best available evaluative research designs and practice-based designs; and by increasing research collaboration between Nordic researchers in relevant fields such as educational science, cognitive neuroscience, developmental psychology (developmental science), sociology of education, child public health, and policy science. Moreover, the research should be concerned with ethical and political issues of the selected approaches.

Research to bridge knowledge gaps in five different regards is suggested:

- (1) Trends: How is the situation;
- (2) Consequences: How important;
- (3) Mechanisms: Why;
- (4) Interventions: What can we do; and
- (5) Policy and implementation: What can we do on a national level?

The following measures are suggested to support Nordic research in this field:

(1) Collaboration grants for Nordic researchers that can pool data and resources for in-depth analyses of trends, mechanisms, consequences, interventions, and policy/implementation.

(2) Support to infrastructure for Nordic comparative research.

(3) Research grants to researchers that plan, supported by systematic reviews of previous research, and conduct original research on such issues as:

- School for all in the Nordic countries: trends, challenges, and remedies in the neoliberal era

- Mechanisms behind the socioeconomic, gender, and health inequalities in school achievement
- Controlled studies of measures taken to improve socioeconomic, gender, and health equality in school achievement
- Studies aiming at improving the working environment in schools, including children, parents, and school staff in research and development
- Studies of physical and mental health, and school achievement: educational trajectory for children in the Nordic countries
- Health promotion in schools in the Nordic countries: studies of educational practice, programmes, and whole-school approach.

(4) A research school in this field could be a measure to facilitate the training of the next generation of researchers in the Nordic countries. This could be an important link between senior Nordic researchers that jointly manage the research school.

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It has been a real challenge to try to scope these extensive fields of research. As I'm working in Sweden, the perspectives of the other Nordic countries may be less covered in this report, but my interest in the Nordic countries has been with me since I became professor in community health at the Nordic School of Public Health in 1987. Constructive comments are welcome at [charli.eriksson48@gmail.com](mailto:charli.eriksson48@gmail.com).

# Background

The overall aim of this report is to highlight the need for knowledge to promote health and development among school-age children in the Nordic countries. Learning in school and for life is a key element for future well-being and quality of life. What happens in our schools is therefore crucially important. The health of school-age children is an important part of educational activities in Nordic schools. It concerns one of the largest parts of the Nordic labour market where teachers, other school staff, and children spend many formative hours and years together.

A comprehensive systematic review on school, learning, and mental health was done ten years ago by a multidisciplinary group of researchers and was conducted on the initiative of the Royal Swedish Academy of Sciences.<sup>1</sup> The review concluded that the study of school, learning, and health is a field of research that is multidisciplinary and not clearly defined. The first step was to conduct a mapping of research on the relationship between schooling and mental health. A second step was an in-depth synthesis of relevant research and focusing on answering the following questions: Which are the causal relationships between mental health and academic achievement? How are these relationships influenced by other factors, both related to the individuals and their social background, and to factors in the educational environment (evaluation system, tests, grades, selection procedures, special educational system, teaching methods, and social climate)?

The third step was to review research which has investigated experiences and perceptions of Swedish children and adolescents concerning their mental health and well-being. It was considered important to listen to the voices of children and youths regarding their own perspectives and perceptions about their health and well-being. Another reason for the third step was to investigate if conclusions from the in-depth review are applicable to the Swedish context.

From the mapping of the literature it was concluded that there seems to be enough literature for the review at the individual level of educational factors, i.e., the students' academic and social

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<sup>1</sup> Gustafsson, J.-E., Allodi, M. Westling, Alin Åkerman, B., Eriksson, C., Eriksson, L., Fischbein, S., Granlund, M., Gustafsson, P. Ljungdahl, S., Ogden, T., & Persson, R. S. (2010). *School, learning and mental health: A systematic review*. Stockholm: Health Committee, The Royal Swedish Academy of Sciences.

achievements and failures.<sup>1</sup> However, studies at the organisational or national level regarding various characteristics of the educational system, reforms, etc. were insufficient for drawing conclusions on educational aspects at the system level. Some studies were available at the educational organisational level (relationship at the classroom level), but few studies had analysed the higher organisational levels.

The in-depth review of 51 high-quality longitudinal studies of the relations between schooling, academic achievement, and mental health supported a series of conclusions.<sup>1</sup> School failure affects mental health as increased internalising and externalising behavioural problems. There is also a relation between academic achievement and positive aspects of mental health. Internalising problems have negative effects on academic achievement. Moreover, mental health and academic achievement are reciprocally related: academic achievement influences mental health and mental health influences academic achievement. Thus, the reciprocal relations may cause vicious spirals, where school failure leads to problems of mental health. Another conclusion was a pattern of stability of mental health problems and school failure from school start into adulthood. Many factors influence the risk for developing mental health problems in the school situation. Social relations with peers can be negative (being mediators of poor self-esteem and agents of social exclusion), but they can also have a protective role against development of mental health problems.

Some children develop mental health problems as a function of adversity, while others do not. This capacity is captured by the concept of resilience, which can be defined as a process by which individuals exhibit adaptive functioning despite encountering significant difficulties.<sup>2,3,4,5,6,7</sup> The concept of resilience has been linked to positive development and good living patterns in

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<sup>2</sup> Luther, S. S., & Cicchetti, D. (2000). The construct of resilience: Implications for interventions and social policies. *Developmental Psychopathology*, 12, 857–885.

<sup>3</sup> Masten, A. A. (2001). Ordinary magic – resilience processes in development. *American Psychologist*, 56, 227–384.

<sup>4</sup> Rutter, M. (1990). Psychosocial resilience and protective mechanisms. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 181–214). New York: Cambridge University Press.

<sup>5</sup> Herrman, H., Stewart, D. E., Diaz-Granados, N., Berger, E. L., Jackson, B., & Yuen, T. (2011). What is resilience? *The Canadian Journal of Psychiatry*, 56(5), 258–265.

<sup>6</sup> Windle, G. (2011). What is resilience? A review and concept analysis. *Review of Clinical Gerontology*, 21(2), 152–169.

<sup>7</sup> Rutter, M. (1993). Resilience: Some conceptual considerations. *Journal of Adolescent Health*, 14(8), 626–631.

longitudinal studies.<sup>8,9,10</sup> A review of longitudinal and cross-sectional studies has identified ten protective factors that play a role in resilience during childhood:<sup>11</sup> (1) effective parenting, (2) affiliation with other competent adults, (3) openness to other persons, especially adults, (4) good intellectual capacity, (5) a talent or skill worthy of the child and others, (6) self-reliance, self-esteem, and hopefulness, (7) religious belief, (8) good socioeconomic conditions, (9) a good school and other resources in the local community, and (10) good luck or success. The resilience of children can be improved by different interventions. Also, a European research collaboration has developed a RESilience CURriculum (RESCUR),<sup>12,13</sup> which is now studied in an on-going implementation and effect study in Sweden.<sup>14</sup>

A key criterion for the inclusion of studies in the review<sup>1</sup> was that the studies needed to be longitudinal, which gives a better possibility to analyse causal relationships and the relationship between different factors than is possible with cross-sectional studies. Longitudinal designs are needed to investigate relations between academic achievement and mental health. Moreover, progress in methodological sophistication of such studies has increased the possibilities of drawing inferences. The presence of intervention studies could facilitate further strong conclusions.

In a previous review of knowledge about health and learning,<sup>15</sup> it was noted that health and learning have mostly been two separated research traditions and seldom integrated. However, there are models and theoretical perspectives that combine these approaches to knowledge building. To do justice to the complex and changing reality, we need a comprehensive and dynamic model. The need for

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<sup>8</sup> Schoon, I. (2006). *Risk and resilience. Adaptations in changing times*. Cambridge: Cambridge University Press.

<sup>9</sup> Ungar, M. (2011). The social ecology of resilience: Addressing contextual and cultural ambiguity of a nascent construct. *American Journal of Orthopsychiatry*, 81(1), 1–17.

<sup>10</sup> Werner, E., & Smith, R. (1989). *Vulnerable but invincible: A longitudinal study of resilient children and youth*. New York: Adams, Bannister, and Cox.

<sup>11</sup> Masten, A. S., & Powell, J. L. (2003). A resilience framework for research, policy and practice. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 1–28). New York: Cambridge University Press.

<sup>12</sup> Cefai, C., Matsopoulos, A., Bartolo, P., Galea, K., Gavogiannaki, M., Assunta Zanetti, M., Renati, R., Cavioni, V., Miljevic-Ridicki, R., Ivanec, T. P., Saric, M., Kimber, B., Eriksson, C., Simoes, C., & Lebre, P. (2014). A resilience curriculum for early years and elementary schools in Europe: Enhancing quality education. *Croatian Journal of Education*, 16(2), 11–32.

<sup>13</sup> Cefai, C., Cavioni, V., Bartolo, P., Simoes, C., Ridicki Miljevic, R., Bouilet, D., Pavin Ivanec, T., Matsopoulos, A., Gavogiannaki, M., Zanetti, M. A., Galea, K., Lebre, P., Kimber, B., & Eriksson, C. (2015). Social inclusion and social justice: A resilience curriculum for early years and elementary schools in Europe. *Journal of Multicultural Education*, 9(3), 122–139.

<sup>14</sup> Eriksson, C., Kimber, B., & Skoog, T. (2018). Design and implementation of RESCUR in Sweden for promoting resilience in children: A study protocol. *BMC Public Health*. <https://doi.org/10.1186/s12889-018-6145-7>

<sup>15</sup> Eriksson, C. (2012). *Kunskap om hälsa och lärande – en översikt av ett forskningsfält under utveckling*. [Knowledge about health and learning – a review of a developing research field]. Stockholm: Vetenskapsrådet, Lilla Rapportserien 2012:2.

scientific knowledge for facilitating evidence-based practice has now been proposed as relevant in several sectors of society.<sup>16</sup>

## Aims

This analysis did not have the resources nor the time to do a systematic review, so a more selective approach was taken. Based on other reviews and partly working as a scoping review,<sup>17</sup> the report seeks to highlight gaps in knowledge and research.

The study addresses a few concerns:

- The research methodologies in the relevant disciplinary fields are diverse and are also affected by various paradigms. Different scientific approaches do not share basic assumptions, research procedures, and analytical methods. Therefore, an introductory section deals with this challenge.
- The school systems in the Nordic countries are similar but also different. This means that it is possible to learn from each other's successes and failures. A brief overview of the Nordic school systems thus follows.
- School achievement is a major focus in this report. However, in order to do multi-country comparisons, the development of large-scale international assessments has been crucially important as a research infrastructure. The report gives some recent results from the PISA study.
- Gender differences in school achievement are a universal finding. Boys are lagging behind girls in school achievement. What do we know about this, what impact does it have, and what can we do to make a school where the children can develop according to their potential? A separate chapter is included in the report.
- Socioeconomic differences in school achievement are typical findings in most countries, so also in the Nordic welfare states. This may seem paradoxical and is further discussed in a chapter.

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<sup>16</sup> Swedish Research Council. (2019). *Kvalitet, implementering och nytta. En FoU-handbok för statliga myndigheter*. [Quality, implementation and benefits. A handbook of research and development for governmental agencies]. Stockholm: Swedish Research Council.

<sup>17</sup> Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18, 143. <https://doi.org/10.1186/s12874-018-0611-x>

- Health development is also linked to school achievement. We have learnt from longitudinal studies that there is a reciprocal relationship between mental health and learning. A chapter discusses certain knowledge gaps and concerns regarding the health development and school achievement.
- A provisional list of knowledge gaps and concerns is given in the last chapter. The report concludes by listing some priorities for future investment in research.

# Introduction 1: On research methodology

Educational research has during the last decades attracted increasing attention by policymakers. Awareness of the usefulness of evidence-based decision-making has increased in many areas of the society. This trend has also affected the school system. A key question is what counts as evidence in the educational context. Policymakers have invested in educational research prompted by the hope of finding what works.<sup>18</sup> However, evidence-based policy-making and large-scale assessments demand a specific kind of educational research. It is therefore relevant to look at different traditions of educational research.<sup>19</sup>

## Different models for educational research

There are several different intellectual styles in educational research.<sup>20</sup> Two very different formats are the Anglo-Saxon educational research model and a German model of a humanities-based and philosophy-grounded pedagogy (Pädagogik).<sup>21</sup> Whereas British educational research has a multidisciplinary and pragmatic character, German educational research reflects pedagogy and mainly humanities-based traditions. In the UK, there was an academising of a multidisciplinary field characterised by expansion but also specialisation and fragmentation. Teacher education was conducted in educational settings different from the university. In Germany, the scholars were deeply rooted in educational theory, philosophy, and history with different sub-disciplines. The preferred type of publication was the sole-authored monograph. International peer-reviewed papers were rare. Teacher education was carried out mainly in higher education institutions solely working with education. In other words, UK research had a wider contextual frame, while German researchers focused more on the individual learner. In both countries, the growing demand for evidence resulted

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<sup>18</sup> Biesta, G. (2007). Why 'what works' won't work: Evidence-based practice and the democratic deficit. *Educational Theory*, 57(1), 1–22.

<sup>19</sup> Zapp, M., Merques, M., & Powell, J. J. W. (2017). Two worlds of educational research? Comparing the levels, objects, disciplines, methodologies, and themes in educational research in the UK and Germany, 2005–2015. *Research in Comparative & International Education*, 12(4), 375–397.

<sup>20</sup> Galtung, J. (1981). Structure, culture and intellectual style: An essay comparing Saxonic, Teutonic, Gallic and Nipponic approaches. *Social Science Information*, 20(6), 817–856.

<sup>21</sup> Biesta, G. (2011). Disciplines and theory in the academic study of education: A comparative analysis of the Anglo-American and continental construction of the field. *Pedagogy, Culture and Society*, 19(2), 175–192.

in increased funding, specific research programmes, and mandatory large-scale assessments.

Models and concepts used to map and synthesise research, information, and data within the field of education were analysed in a recent review.<sup>22</sup> This review focuses on international perspectives on research mapping and knowledge synthesis for the dissemination of knowledge and scientifically approved methods to improve teaching and learning in education. The study shows that there are a lot of different types of institutions working within this line of knowledge brokerage. The products generated from research mapping and knowledge synthesis also vary greatly between countries. The review found indices that there is a divide between more Anglo-Saxon approaches, characterised by systematic reviews and meta-analysis, and more Continental European approaches, which tend to have various types of synthesis of information, data, and research. Working with evidence-based practice (EBP) seems to be influenced by differences in understanding of what evidence is, and it varies according to differences in research traditions between countries and regions, and in terms of what kind of evidence is available. Organisations with a strong EBP ambition put a lot of emphasis on knowing the contextual situation of the practice field in relation to which they work. An understanding of 'one size does not fit all' and recognition of the need for local adaptation and flexibility have a strong position. Another common feature of these EBP-organisations is that they put a lot of effort into work that systematically activates and integrates the knowledge they develop in realistic situations or through structural arrangements. Moreover, organisations that work closely with practice assume a hybrid position involving both scientific practice and the use of scientific knowledge.

Educational research in the Nordic countries has been influenced both by the German and the Anglo-Saxon research models. The Swedish Research Council (VR) presented the challenges for the field as follows:<sup>23</sup>

'Major societal challenges require considerable research input to better understand the starting points and processes relating to

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<sup>22</sup> Prøitz, T. S. (2015). *Modeller og konsepter for kartlegging og sammenstilling av evidens innenfor det utdanningsvitenskapelige området. Delrapport från skolforsk-projektet*. [Models and concepts for scoping and systematic review within education sciences]. Stockholm: Vetenskapsrådet. [https://www.vr.se/download/18.2412c5311624176023d25b40/1556010528071/Modeller-og-konsepter-for-kartlegging-og\\_VR\\_2015.pdf](https://www.vr.se/download/18.2412c5311624176023d25b40/1556010528071/Modeller-og-konsepter-for-kartlegging-og_VR_2015.pdf)

<sup>23</sup> *Research overview 2019: Educational sciences*. Stockholm: Swedish Research Council. [https://www.vr.se/download/18.6969eb1a16a5bec8b59823/1557492596398/Research-overview-educational-research\\_VR\\_2019.pdf](https://www.vr.se/download/18.6969eb1a16a5bec8b59823/1557492596398/Research-overview-educational-research_VR_2019.pdf)

different problems, and to understand the role and opportunities of the educational sector to contribute to change. Here many different types of research are required, both broad and deep studies, longitudinal case and cohort studies, experimental and quasi-experimental studies, several different theoretical and subject-based perspectives, critical approaches as well as syntheses and meta-analyses, research reviews and interdisciplinary studies' (p. 8).

In their proposal to the Swedish government,<sup>23</sup> the Committee for Educational Sciences in the VR also suggested that additional resources are needed for strategic initiatives within the following research themes: Development of democracy in Sweden and the world; Increasing variations in school performance; Teachers' working situation and future recruitment; and Learning in a digitised world: handling everyday life and competences for the future.

## Clearing houses and brokerage units

One challenge is to close the gap in the knowledge available and the application of knowledge within the school system. A recent initiative in Sweden is of interest in this context. Organisations with similar missions exist in all Nordic countries.

The Swedish Institute for Educational Research (Skolforskningsinstitut; SKOLFORSK) was established in January 2015 with the task to compile practice-oriented school research. The institute is responsible for systematically assessing and disseminating research findings that can contribute to increased knowledge about scientifically well-founded and effective methods and procedures in the school system.<sup>24</sup> The specific tasks recommended for this institute include to:

- 'ensure the quality of the systematic research reviews and of the research initiated,
- monitor the authenticity of translations, original interpretations, and findings,
- develop new forms of systematic knowledge analyses – forms that better meet the needs of Swedish teachers and

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<sup>24</sup> *Forskning och skola i samverkan – kartläggningar av forskningsresultat med relevans för praktiskt arbete i skolväsendet* (2015) [Research and schools in collaboration – surveys of research results of relevance for practical work in schools]. Stockholm: Vetenskapsrådet.  
[https://www.vr.se/download/18\\_2412c5311624176023d25ad2/1555424743747/Forskning-och-skola-i-samverkan\\_VR\\_2015.pdf](https://www.vr.se/download/18_2412c5311624176023d25ad2/1555424743747/Forskning-och-skola-i-samverkan_VR_2015.pdf)

principals for relevant, reliable, and practically sustainable knowledge,

- involve teachers in the review processes to ensure the practical relevance of the results and involve researchers to ensure scientific relevance and quality,
- ensure that the research presented is of a non-normative nature, which means that it is conducive to open and critical dialogue and is geared toward strengthening the professional development of teachers,
- build up long-term structures in order to provide quality assurance for the use of the research with networks concerning specific issues as a way to develop skills surrounding qualified interpretations of research findings,
- establish relations and an infrastructure for interaction between different entities,
- call attention to the wealth of studies conducted by or in cooperation with teachers on various academic levels and within various parts of the school organisation, on the national, regional, and local level,
- examine forms for how teachers who conduct studies on the doctoral level can be given incentives to further disseminate their knowledge,
- develop different methods of systematising the research of teachers and making the added knowledge this type of research generates available, and
- collaborate with other entities on the national, regional, and local level to disseminate compilations of knowledge and with entities in the research system with respect to research issues.’<sup>25</sup>

In a background document to SKOLFORSK<sup>26</sup>, four different models and strategies for using research in the school setting were identified in the literature: (i) Dissemination of research results (information);

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<sup>25</sup> *Forskning och skola i samverkan – kartläggningar av forskningsresultat med relevans för praktiskt arbete i skolväsendet* (2015) [Research and schools in collaboration – a survey of research results of relevance for practical work in schools]. Stockholm: Vetenskapsrådet, p. 6.

<sup>26</sup> Sundberg, D., Adolfsson, C-H. (2015). Att forskningsbasera skolan – En analys av utbildningspolitiska frågeställningar och initiativ över en 20 års period. Stockholm: Vetenskapsrådet.  
<https://www.vr.se/analys/rapporter/vara-rapporter/2015-07-03-att-forskningsbasera-skolan-delrapport.html>

(ii) Development of research-related competence (education); (iii) Use and link practical questions to research results (brokerage); and (iv) Development of core competences through research (interactive research). During the last 20 years, there have been many efforts to bridge the gap between research and school practice. The development has been towards more directly linking the practice and practitioners' access and involvement in research. However, an important task is to initiate school- or practice-based research where such knowledge is missing. In order to achieve evidence-based practice we need practice-based evidence.<sup>27</sup>

There are several organisations like SKOLFORSK that work as brokering organisations.<sup>28</sup> These are based within the health, social work, and medical sectors, and include the following:

The Norwegian Research Centre for Health Services (Kunnskapssenter for helsetjenesten)<sup>29</sup> was established in 2003 as an independent agency under the Ministry of Health and Care Services but has since 2016 been a department within the Norwegian Institute of Public Health.

The Knowledge Centre for Education (Kunnskapssenter for utdanning)<sup>30</sup> was established in 2019 at the University of Stavanger in Norway, with the main aim to improve the quality in the educational sector from preschool to higher education. In 2013–2019, the centre was a unit of The Research Council of Norway.

The Danish Center for Social Science Research (VIVE) is an independent research and analysis centre that carries out work on all the major welfare areas.<sup>31</sup> It has a vision: (1) that production and dissemination of knowledge is up-to-date and relevant for the benefit of the development of the Danish welfare state; (2) to be the preferred and indispensable supplier of knowledge who can qualify and support decision processes for public decision-makers, private stakeholders, and the general public; and (3) to be Denmark's strongest environment for applied research and analysis in the area

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<sup>27</sup> Green, L. W., Glasgow, R. E., Atkins, D., & Stange, K. (2009). Making evidence from research more relevant, useful, and actionable in policy, program planning, and practice. *American Journal of Preventive Medicine*, 37(6), S 187–190.

<sup>28</sup> Levinsson, M. (2015). Kartläggning och sammanställning av forskning i Norden. Delrapport från skolforsk-projektet. [Mapping and compilation of research in the Nordic countries]. Stockholm: Vetenskapsrådet.

[https://www.vr.se/download/18\\_2412c5311624176023d25b2e/1555424797953/Kartlaeggning-o-sammanstaellning-av-forskning-i-Norden\\_VR\\_2015.pdf](https://www.vr.se/download/18_2412c5311624176023d25b2e/1555424797953/Kartlaeggning-o-sammanstaellning-av-forskning-i-Norden_VR_2015.pdf)

<sup>29</sup> <https://www.oslo2013.no/nasjonalt-kunnskapssenter-for-helsetjenesten/>

<sup>30</sup> <https://utdanningsforskning.no/kilderpersoner/forskningsressurser/kunnskapssenter-for-utdanning/>

<sup>31</sup> <https://www.vive.dk/en/>

of welfare and a natural choice as a collaborative partner at home and abroad.

The Danish Clearinghouse for Educational Research was established at the School of Education, University of Aarhus, at the end of 2006. The purpose was to provide politicians and practitioners with the current best knowledge, which the clearinghouse did by performing three functions: it collected and analysed information, and distributed knowledge firmly anchored in the best evidence available. However, this clearinghouse was closed on April 1, 2019, and its activities were integrated into the work of the Danish Center for Social Science Research.

Two organisations in Denmark produce systematic reviews. These are the national units of two international collaborators Cochrane (medical reviews) and Campbell (social scientific reviews). The Campbell Collaboration also has limited activities in the field of education.

The Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU)<sup>32</sup> is an independent national authority, tasked by the government with assessing health care and social service interventions from a broad perspective, covering medical, economic, ethical, and social aspects. SBU was founded in 1987 and is one of the oldest HTA (Health Technology Assessment) organisations in the world. SBU assessments are based on systematic literature reviews of published research. The review method developed by SBU is thorough and rigorous. A series of SBU reports address an evidence gap which identifies methods or practices for which no conclusive systematic review of benefits and harms has been published. Gaps in scientific evidence are listed on the SBU website to help researchers and granting agencies identify areas that need research or systematic review.

In comparison to the well-established units in medicine and social sciences such as the Cochrane Collaboration and the Campbell Collaboration, the brokerage units in educational science are small regarding resources and staff.

## How is evidence defined?

One key question is how evidence is defined and who has the power to make the definition. The hierarchy of evidence usually has the following ranking order:<sup>33</sup> 1) Systematic reviews and meta-analyses;

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<sup>32</sup> <https://www.sbu.se/en/>

<sup>33</sup> Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences*. Oxford: Blackwell.

2) Randomised controlled trials with definitive results; 3) Randomised controlled trials with non-definitive results; 4) Cohort studies; 5) Case–control studies; 6) Cross-sectional surveys; and 7) Case reports. As such a fixed hierarchy is problematic, many different typologies have been proposed for identifying the strengths and weaknesses of the various approaches and research questions.

A systematic review is particularly valuable as a means of reviewing all the evidence on a question if there is some uncertainty about the answer. A distinction has been proposed between configurative and aggregative approaches to systematic reviews.<sup>34</sup> The configurative review (sometimes called a narrative review) is conceived of as interpretative of different kinds of studies and their conceptual contributions, while the aggregated review is based on aggregated collection of data from different studies. These approaches are summarised in Table 1.

Table 1: Configurative and aggregative approaches to systematic research reviews<sup>34</sup>

Characteristics	Configurative	Aggregative
Philosophy	Idealist	Realist
Relation to theory	Generate	Test
Approach to synthesis	Configuring	Aggregating
Methods	Iterative, Theoretical search	Exhaustive search, Avoid bias
Quality assessment	Value study contributions	Avoid bias
Product	Emergent concepts	Magnitude and precision
Review use	Enlightenment	Instrumental

There is some convergence between these two approaches when mixed-methods approaches are used in the studies, but there is still a need for high-quality research on questions related to school achievement, social equality, and health development. As in public

<sup>34</sup> Lindblad, S., Pettersson, D., & Popkewitz, T. S. (2015). *International comparisons of school results: A systematic review of research on large scale assessments in education*. Stockholm: Swedish Research Council. [https://www.vr.se/download/18.2412c5311624176023d25538/1555426958403/International-Comparisons-of-School-Results\\_VR\\_2015.pdf](https://www.vr.se/download/18.2412c5311624176023d25538/1555426958403/International-Comparisons-of-School-Results_VR_2015.pdf)

health, learning and knowledge production in this field must be comprehensive and include knowledge from five different knowledge domains:<sup>35</sup> (i) distribution of relevant characteristics; (ii) determinants or causal web; (iii) consequences; (iv) intervention methods; and (v) policy options. Knowledge of scaling-up to the population level is also important. For this, studies of effects of different methods and interventions need to be analysed. These can be efficacy studies done under optimal conditions, where the researcher has a high degree of control. Such methods can also be studied under ordinary conditions in effectiveness studies. There is a need for more piloting of different interventions in the school system before national implementation. An example is a suggested experimental approach to the analysis of the effects of different approaches to reduce school class sizes.<sup>36</sup>

## Specialisation and going beyond disciplinary borders<sup>37</sup>

The development in the universities can be regarded as an increasingly specialised activity where the research approaches are influenced by how attractive the questions are for publishing and citations. In the social sciences, this has been described as a transition from science as a vocation to science as a game.<sup>38</sup> The concern of some academics is to get published rather than having something socially meaningful to say. Higher education has transformed from a temple of wisdom to a factory producing academic credits for the many. There is competition about status positions, the micro level of individuals pursuing career success, the meso level of universities wanting position and repute, and the macro level of societies gaining advantages of knowledge societies, international reputation, and votes in national elections. The researchers have not only to satisfy the requirements of local and national colleagues but also meet the international reviewers and the global competition. Researchers face the challenge of defining themselves and others as engaged knowledge seekers instead of just paper-producing technicians.

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<sup>35</sup> Eriksson, C. (2000). Learning and knowledge-production for public health – a review of approaches to evidence-based public health. *Scandinavian Journal of Public Health*, 28, 298–308.

<sup>36</sup> Solheim, O. J., & Opheim, V. (2019). Beyond class size reduction: Towards more flexible ways of implementing a reduced pupil–teacher ratio. *International Journal of Educational Research*, 96, 146–153. <https://doi.org/10.1016/j.ijer.2018.10.008>

<sup>37</sup> This section is based on a previous report: Eriksson, C. (2019). En analys av omvärlden för Institutionen för Kost- och Idrottsvetenskap, Utbildningsvetenskapliga fakulteten, Göteborgs universitet. Stockholm.

<sup>38</sup> Alvesson, M., Gabriel, Y., & Paulsen, R. (2017). *Return to meaning. A social science with something to say*. Oxford: Oxford University Press.

Modern science has a tendency towards specialisation and fragmentation. Interdisciplinary science is a multifaceted phenomenon, which can be an antidote to these trends. Disciplinary boundaries are constituted by differences in theory and method, and partly by an organisational, social, and cultural dimension.<sup>39</sup> This is reinforced by the fact that higher education is to a large extent based on organised disciplinary knowledge. Researchers need significant in-disciplinary competence to be able to violate disciplinary boundaries in a constructive way. At the same time, an interdisciplinary collaboration means that one becomes aware of one's own scientific identity and the difficulties in communicating between different sciences with often different linguistic uses.<sup>40</sup> In other words, interdisciplinarity requires researchers who can combine specialist expertise with the breadth and openness of the generalist.

Integration is what is sought after in interdisciplinary science. It is about what should be integrated (theories, methods, concepts), how the integration should be done, and by whom.<sup>41</sup> Three types of analysis are typically distinguished in interdisciplinary research. The first is the multidisciplinary type, where research in a problem area is done with the methods of several individual disciplines in parallel – side by side but largely independent of each other. The second is the interdisciplinary approach, where researchers from two or more disciplines collaborate in areas that overlap in a disciplinary or methodological way. This type of research requires a shared problem formulation and to some extent a shared methodological research approach. The third is the transdisciplinary path, which transcends disciplinary boundaries. It involves the development of a common language and new or unique methodologies. Transdisciplinarity has four characteristics:<sup>42</sup> (1) it develops a framework for guiding problem-solving efforts, (2) develops its own distinct theoretical structures, methods, and practical approaches, (3) communicates beyond the institutional pathways directly to those who participated in the research, and (4) it is dynamic with less predictable processes than in disciplinary research. Cooperation also takes place both between researchers with different disciplinary backgrounds and

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<sup>39</sup> Sandström, U. (2003). Tvärvetenskap med förhinder. In L. Lundgren (Ed.), *Vägar till kunskap. Några aspekter på humanvetenskaplig och annan miljöforskning* (pp. 237–262). Stockholm: Symposion.

<sup>40</sup> Qvarsell, R., & Sandin, B. (2000). Den tvärvetenskapliga erfarenheten. In R. Qvarsell & B. Sandin (Eds), *Den mångfaldiga historien. Tio historiker om forskningen inför framtiden* (pp. 57–77). Lund: Historiska Media.

<sup>41</sup> Mobjörk, M. (2009). *Crossing the framing of transdisciplinarity*. Örebro: Örebro University, Centre for Housing and Urban Research Series Report number 64.

<sup>42</sup> Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge. The dynamics of science and research in contemporary societies*. London: Sage.

between researchers and practitioners. A summary is given in Table 2.

Table 2: Characteristics of different types of interdisciplinarity<sup>43</sup>

	Multi-disciplinary	Inter-disciplinary	Trans-disciplinary
Which is the main motive?	Mainly instrumental	Both instrumental and critical	Both instrumental and critical
Is there any cooperation between disciplines?	To some extent	Yes	Yes
Is there (active) cooperation between researchers and practitioners during the research process?	No	No	Yes
Are methodologically challenging issues addressed?	To some extent	Yes, to a certain degree	Yes, to a certain degree
Are epistemologically challenging issues addressed?	To a minor degree	To some extent, but not necessary	Yes, to a certain degree

In summary: The challenges and problems often need approaches that go beyond the disciplinary boundaries. In this context it would be very beneficial if educational sciences could be combined with complementary scientific fields such as cognitive neuroscience, developmental psychology (developmental science), sociology of education (child studies), and child public health.

## The position of scientific knowledge threatened

At the same time, there is a tendency for the trust in science to diminish. This change is based on several different conditions. One is that the public's confidence in authorities decreases in the postmodern society. This has been found in the World Value Survey.<sup>44</sup> Another is the varied view of what science is. Science is a way of understanding the world, but there are certain characteristics that separate science from nonsense. Documented methods and

<sup>43</sup> Mobjörk, M. (2009). *Crossing the framing of transdisciplinarity*. Örebro: Örebro University, Centre for Housing and Urban Research Series Report number 64, p. 29.

<sup>44</sup> Inglehart, R. (1997). *Modernization and postmodernization. Cultural, economic, and political change in 434 societies*. Princeton, N.J.: Princeton University Press.

reasoning must be used, and in order to be scientific a theory must be possible to falsify.<sup>45</sup> There are many different scientific approaches, which are based on different paradigms with an accompanying view of knowledge, scientific ideal, and research approaches.

The scientific craft is about the following:<sup>46</sup> (1) Questioning and a critical approach is central. It is not about believing in everything that is said or written, but questioning the information you get, including your own research and your own worldview. (2) Systematic collection of information involves trying to get a comprehensive picture and avoiding selection and limited databases. (3) Rational evaluation of the information means that assessment is done in the most objective way possible, without the researcher's own perception of reality unduly colouring the conclusions. In other words, the central tools are source criticism, gathering the right information, and evaluating information.

It is a challenge to explore new areas and controversial phenomena. Here, the defender of knowledge believes that this can be done through the application of methods that strengthen the studies through procedures such as blinding (independent assessments), the use of designs with control groups, and statistical methods to distinguish real results from what randomisation can give.

A central endeavour has been to find what is truth, something objectively certain. It has been proposed that we have come to a 'post-truth era', where alternative facts replace real facts and where emotions are truer than facts in order to subordinate reality to politics.<sup>47</sup> The changed perspective on what truth is increased gradually until now when a relevant question to ask is whether the truth is dead.<sup>48</sup>

One of the main drivers for this development is the digitisation and information flow via the Internet. Where we once relied on others who knew more – experts and journalists – we now search the web for information.<sup>49</sup> But to make it easier for us to sort through the extensive and fragmented information flow, the actors on the net use algorithms, which have learned to filter out what we do not seem

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<sup>45</sup> Ingvar, M. (2012). *Vad är vetenskap? Och 100 andra jätteviktiga frågor*. Halmstad: Bokförlaget Lagenskiöld.

<sup>46</sup> Frans, E. (2017). *Larmrapporten – att skilja vetenskap från trams* [The emergency report – separating science from nonsense]. Stockholm: Volante

<sup>47</sup> McIntyre, L. (2018). *Post-truth*. Cambridge, MA: MIT Press.

<sup>48</sup> Kakutani, M. (2018). *The death of truth*. London: William Collins.

<sup>49</sup> Granqvist, P. (2018). *Den stora bubblan. Hur tekniken formar vår världsbild* [The big bubble. How technology shapes our worldview]. Stockholm: Mondial.

to like. As a result, those who search the Internet often receive information that confirms the worldview that they already have. However, this is mainly the case with advertising material.

In addition, it is easy for us, as human beings, to suffer from a confirmation bias, which arises when we actively seek information that confirms our beliefs, and avoid other information.<sup>50</sup> This is a fact polarisation, something that the new media landscape is contributing to. Lies, fake news, and propaganda flourish, which creates a need to develop media and source-critical capabilities. The cure for filter bubbles, false facts, and skewed worldviews are facts framed in meaningful contexts.

The quest to base the practice on knowledge or evidence has an important ambition. It originates in modern times from medicine and from the influential book in 1972 by the English physician Archie Cochrane (1909–1988), *Effectiveness and efficiency – Random reflections on health services*.<sup>51</sup> The starting point is that a lot is done without really knowing if it has any effect. As resources are always limited, efforts must have been shown to be effective in well-designed evaluations before they have a wider use. Cochrane emphasises the importance of evidence from randomised trials (RCTs) because, in this view, they provide more credible (reliable) information than other studies. It is a matter of critically examining all well-made studies and based on these, to make systematic knowledge reviews. International cooperation has been developed in medicine through the establishment of the Cochrane Collaboration (1993),<sup>52</sup> and in education, social work, and criminology through the establishment of the Campbell Collaboration (1999).<sup>53</sup> There is a great need for knowledge of possible developmental efforts through systematic, planned studies. For this, studies of various initiatives are required, both in terms of change processes, effects, and sustainability (lasting effects).

The knowledge needs of the practitioners are great, which means a requirement for evidence or a good scientific basis for the practice. Also, research needs to be relevant to practice.<sup>54</sup> Only 13% of the 1402 dissertations reviewed in public health science, criminology,

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<sup>50</sup> Wikforss, Å. (2017). *Alternativa fakta. Om kunskapen och dess fiender* [Alternative facts. On knowledge and its enemies]. Lidingö/Stockholm: Fri tanke.

<sup>51</sup> Cochrane, A. (1972). *Effectiveness and efficiency – Random reflection on health services*. London: Nuffield Provincial Hospital Trust.

<sup>52</sup> <https://www.cochrane.org/>

<sup>53</sup> <https://campbellcollaboration.org/>

<sup>54</sup> Green, L. W., Glasgow, R. E., Atkins, D., & Stange, K. (2009). Making evidence from research more relevant, useful, and actionable in policy, program planning, and practice. *American Journal of Preventive Medicine*, 37(6S1), S 187–190.

nursing science, pedagogy, psychology, social work, and sociology (1997–2006) included studies of the effects of interventions.<sup>55</sup> However, the two fields of research in public health and educational sciences are getting closer. Evidence can have many faces.<sup>56,57</sup> Evidence-based urban development<sup>58</sup> is a newly created area where scientific, professional, organisational, and stakeholder evidence are combined. It is thus a matter of combining different types of evidence to provide an expanded basis for decisions. The pursuit of moving from faith to knowledge has made a great impact on politics and many scientific and professional fields.<sup>59</sup> The content of the debate has been very much about what is to be regarded as evidence and how the quality of different studies should be assessed. Theories of science controversies can also be hidden in questions about whether different research methods can be combined or whether they are incompatible. The pragmatic approach within the mixed-methods approach creates good conditions for practical, relevant knowledge.

In summary: The position of the scientific knowledge is threatened both by a lack of confidence in authorities in the postmodern society and by different views on what evidence the research can contribute. It is therefore important to develop scientific and practical knowledge as well as practical wisdom. It is my belief that knowledge dissemination and the development of knowledge<sup>60,61</sup> are promoted if they rest on scientific and practical knowledge<sup>62,63,64,65</sup> as well as on practical wisdom.<sup>66</sup>

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<sup>55</sup> Sundell, K., & Svensson, E. (2010). *Effektutvärderingar i doktorsavhandlingar* [Effect evaluations in doctoral dissertations]. Stockholm: Socialstyrelsen.

<sup>56</sup> Bolin, I., & Sager, M. (Eds.). (2011). *Evidensens många ansikten. Evidensbaserad praktik i praktiken* [The many faces of evidence. Evidence-based practice in practice]. Lund: Arkiv.

<sup>57</sup> Schäfer Elinder, L., & Kwak, L. (Eds.). (2014). *Evidensbaserat folkhälsoarbete* [Evidence-based public health action]. Lund: Studentlitteratur.

<sup>58</sup> Foremalm, J., Johansson, M., & Göransson, P. (2019). *Evidensbaserad stadsutveckling – bortom urbana anekdoter* [Evidence-based urban planning – beyond urban anecdotes]. Årsta: Dokument Press.

<sup>59</sup> Eriksson, C. (2012). *Kunskap om hälsa och lärande – en översikt av ett forskningsfält under utveckling*. [Knowledge about health and learning – a review of a research field under development]. Stockholm: Vetenskapsrådet, Lilla Rapportserien 2012:2.

<sup>60</sup> Gustavsson, B. (2002). *Vad är kunskap? En diskussion om praktisk och teoretisk kunskap* [What is knowledge? A discussion of practical and theoretical knowledge]. Stockholm: Myndigheten för skolutveckling (serien Forskning i fokus nr 6).

<sup>61</sup> Gustavsson, B. (2000). *Kunskapsfilosofi – Tre kunskapsformer i historisk belysning* [Philosophy of knowledge – Three forms of knowledge in a historical perspective]. Stockholm: Wahlström & Widstrand.

<sup>62</sup> Molander, B. (1996). *Kunskap i handling* [Knowledge in action]. Göteborg: Daidalos.

<sup>63</sup> Gustavsson, B. (Ed). (2004). *Kunskap i det praktiska* [Knowledge in practice]. Lund: Studentlitteratur.

<sup>64</sup> Higgs, J., Richardson, M., & Abrandt Dahlgren, M. (Eds.). (2004). *Developing practice knowledge for health professionals*. Edinburgh: Butterworth Heinemann.

<sup>65</sup> Jernström, E., & Säljö, R. (Eds.). (2004). *Lärande i arbetsliv och var dag* [Learning in working life and everyday life]. Jönköping: Brain Books.

<sup>66</sup> Silverberg, G. (1999). *Praktisk klokhet. Om dialogens och dygdens betydelse för yrkesskicklighet och socialpolitik* [Practical wisdom. On the importance of dialogues and virtues for professionalism and social policy]. Stockholm, Symposium.

The practice needs knowledge badly, which means a requirement for a scientific evidence base for the practice. Consequently, this places several demands on the research, which must be relevant to the practice<sup>67</sup> and should have good scientific quality. Knowledge in action is a living knowledge, in constant motion, in alternation between feeling and distance, between reaction and reflection, between part and whole, between trust and criticism. If we want a more knowledge-based practice, we must also have more practice-based knowledge. The values and practical wisdom are also important aspects of a successful work. This view of knowledge development is in line with the quest to develop the knowledge base for practical activities in several areas such as public health science, psychology, social work, criminal justice, and educational science.<sup>68</sup>

In order to be able to implement evidence-based practice, the evidence base needs to be available. There has to be a reasonable knowledge base that can support the decision-makers. As pointed out above, a comprehensive knowledge base consists of several components. This includes knowledge about the distribution or prevalence of different phenomena, determinants or the causal web behind the phenomena, the consequences of the phenomena, possibilities for changing the phenomena or interventions, and possibilities for changes in policy and implementation of importance for changing the phenomena on a large scale.

A comprehensive research approach is needed in educational research, where quantitative and qualitative approaches are used in tandem, thus enhancing empirically based cross-fertilisation. Moreover, different theoretical perspectives and practice-based knowledge are valued, and a more integrated framework is needed, shifting from unidisciplinary and multidisciplinary modes to interdisciplinary and transdisciplinary modes of research.

## Knowledge gaps and concerns

- There is a need for studies on the implementation, methods, and sustainability of different educational innovations and measures both under optimal and realistic conditions. The scaling up should be grounded in evidence from practice-based research.

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<sup>67</sup> Green, L. W., Glasgow, R. E., Atkins, D., & Stange, K. (2009). Making evidence from research more relevant, useful, and actionable in policy, program planning, and practice. *American Journal of Preventive Medicine*, 37(6S1), S 187–190.

<sup>68</sup> Eriksson, C., Beckman, L., Edvardsson, I., Jensen, J., Larsson, A. & Meijer, K. (2014). *Kunskapsutveckling för ökad samverkan mellan barn- och vuxenvård inom socialtjänsten* [Knowledge development for increased cooperation between child and adult care in social services]. Örebro universitet: Studier i folkhälsovetenskap 2014:2.

- Moreover, there is a need for systematic review and analysis of multidisciplinary and educational research in many fields. Such analysis should be used for allocation of research and development initiatives conducted as transdisciplinary studies involving school staff, pupils/students, and parents.
- Innovative models of practice-based transdisciplinary research need to be developed, implemented, and sustained in order to facilitate research and development (R&D) and policy and implementation (P&I) within the school systems in the Nordic countries.
- There is a need for scientific knowledge, practical knowledge, and practical wisdom to guide further development of the school systems at different levels in the Nordic countries.

# Introduction 2: On the Nordic school system

The overall aim of this report is to review existing research regarding school achievement among school children in the Nordic countries in order to identify knowledge gaps and research needs. During the period from the late 1940s to the 1980s, common ideas about the functions and organisation of education framed the development of the school systems in the five Nordic countries at primary and lower secondary levels.<sup>69</sup>

Since the 1960s and 1970s, all Nordic countries have implemented comprehensive school systems as a contrast to tracking systems where students were separated by academic ability into groups for all subjects, or into certain classes and curricula within a school.<sup>70, 71</sup> The School for All has been high on the educational agenda for many years and the concept has been closely related to the development of the twentieth-century Nordic welfare states.<sup>72</sup>

## A Nordic model of education?

Is – or was – there also such a thing as a Nordic model of education? Education has certainly been an important part of the Nordic welfare system, regarded as a crucial instrument for social justice and security by providing schooling of high and equal quality to all citizens regardless of social class, gender, or geographic origin and location. Education is a highly political institution that is historically and socially constituted, with a partly autonomous existence, although framed by regulations, structures, and institutional histories.

In a special issue of the *Journal of Education Policy* in 2002, Nordic researchers discussed and analysed the changes to education

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<sup>69</sup> Lundahl, L. (2016). Equality, inclusion and marketization of Nordic education: Introductory notes. *Research in Comparative & International Education*, 11(1) 3–12.

<sup>70</sup> Gustafsson, J.-E., & Blömeke, S. (2018). Development of school achievement in the Nordic countries during half a century. *Scandinavian Journal of Educational Research*, 62(3), 386–406.

<sup>71</sup> Arnesen, A.-L., & Lundahl, L. (2006). Still social and democratic? Inclusive education policies in the Nordic welfare states. *Scandinavian Journal of Educational Research* 50(3), 285–300.

<sup>72</sup> 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: Springer.

policies that had occurred in their countries during the 1990s.<sup>73, 74, 75, 76, 77</sup> They concluded that developments like those seen in other OECD countries had also taken place in the Nordics, mainly in terms of decentralisation, introduction of new public management (NPM), and an enhanced emphasis on individual agency and choice. However, the expressions of marketisation were still rather modest, even in Sweden.<sup>76</sup>

Researchers have also noted the importance of social inclusion in the education policies of the Nordic countries and have analysed the extent to which education has been regarded as a part of welfare policy.<sup>78</sup> They have distinguished four aspects of social inclusion: (a) access to education and to the labour market; (b) integration vs. division of education in terms of public/private and integration/segregation of, for example, ethnic minority children and children with special needs; (c) emphasis on democratic values and participation; and (d) the importance of community and equality vs. a focus on the individual.

Differentiation/division of education is another aspect. Streaming is still largely absent from compulsory education in the Nordic countries, and special education support has moved from separate schools and classes to the 'inclusive school', that is, it is to a great extent now integrated with other teaching in the classroom.<sup>79, 80</sup>

The education systems of the five Nordic countries still display a number of common inclusive distinguishing qualities, enabled by continued extensive public funding of education: free of charge education and related services at primary, secondary, and tertiary levels, well thought-out preschool education and childcare, integration of students in need of special support in ordinary classrooms, etc. In addition, all the Nordic countries retain nine- or 10-year comprehensive compulsory education with little or no

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<sup>73</sup> Jónasson, J. T. (2002). Policy and reality in educational development: An analysis based on examples from Iceland. *Journal of Education Policy*, 17(6), 659–671.

<sup>74</sup> Lundahl, L. (2002). Sweden: Decentralization, deregulation, quasi-markets – and then what? *Journal of Education Policy*, 17(6), 687–697.

<sup>75</sup> Rasmussen, P. (2002). Education for everyone: Secondary education and social inclusion in Denmark. *Journal of Education Policy*, 17(6), 627–642.

<sup>76</sup> Rinne, R., Kivirauma, J., & Simola, H. (2002). Shoots of revisionist education policy or just slow readjustment? The Finnish case of educational reconstruction. *Journal of Education Policy*, 17(6), 643–658.

<sup>77</sup> Welle-Strand, A., & Tjeldvoll, A. (2002). The Norwegian unified school – a paradise lost? *Journal of Education Policy*, 17(6), 673–686.

<sup>78</sup> Arnesen, A.-L., & Lundahl, L. (2006). Still social and democratic? Inclusive education policies in the Nordic welfare states. *Scandinavian Journal of Educational Research*, 50(3), 285–300.

<sup>79</sup> Blossing, U., Imsen, G., & Moos, L. (Eds.) (2014). *The Nordic education model. 'A school for all' encounters neo-liberal policy*. Dordrecht: Springer.

<sup>80</sup> Egelund, N., Haug, P., & Persson, B. (2006). *Inkluderande pedagogik i skandinaviskt perspektiv* [Inclusive pedagogy in Scandinavian perspective]. Stockholm: Liber.

tracking. The Nordic countries are almost the only OECD countries that do not have higher education tuition fees.<sup>81</sup> Nordic school children have access to free healthcare, special education for those who need it, career counselling, and school transport. Finland and Sweden provide free hot meals during the school day, whereas in Iceland parents must pay for such meals. Danish and Norwegian children typically take a lunch box to school.<sup>82</sup>

Researchers argue that it is still relevant to speak of a Nordic education model that emphasises social justice and equality.<sup>81</sup> However, decentralisation from the state to the local level and various neoliberal policy measures have been applied in all of the Nordic countries (albeit to varying degrees and in different forms), and these changes have undoubtedly undermined the foundations of the Nordic model. For empirical descriptions, see national analyses for Denmark<sup>83</sup>, Finland<sup>84</sup>, Iceland<sup>85</sup>, Norway<sup>86</sup>, and Sweden<sup>87</sup>.

## Sweden

In a recent comparative study of public education and the institution of the school in Sweden and England, the researchers found on the surface a similar response to institutional designs based on the principles of the market and managerialism, with the opening up of the school systems to private interests and actors.<sup>89</sup> This has challenged or changed the values of solidarity and equality that underpinned many of the older narratives of the purpose of education. In tracing the trajectories of educational change in the two countries and exploring the contemporary experiences of reforms by school actors, the researchers argued that despite the common dominant discourses of education reform, the two systems have responded rather differently.<sup>88</sup>

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<sup>81</sup> OECD. (2014). *Education at a glance 2014: Highlights*. Paris: OECD Publishing.

<sup>82</sup> EUFIC. (2012). School lunch standards in Europe. *Food Today* 09/2012. Available at: <http://www.eufic.org/article/en/artid/School-lunch-standards-in-Europe/>

<sup>83</sup> Rasmussen, A., & Moos, L. (2014). A school for less than all in Denmark. In: U. Blossing, G. Imsen, & L. Moos, L. (Eds.), *The Nordic education model. 'A school for all' encounters neo-liberal policy* pp. 57–75. Dordrecht: Springer.

<sup>84</sup> Arhonen, S. (2014). A school for all in Finland. In: U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic education model. 'A school for all' encounters neo-liberal policy* (pp. 77–93). Dordrecht: Springer.

<sup>85</sup> Sigurdardottir, A.K., Gudjonsdottir, H., & Karlsdottir, J. (2014). The development of a school for all in Iceland: Equality, threats, and political conditions. In U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic education model. 'A school for all' encounters neo-liberal policy* (pp. 95–113). Dordrecht: Springer.

<sup>86</sup> Imsen, G., & Volckmar, N. (2014). The Norwegian school for all: Historical emergence and neoliberal confrontation. In U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic education model. 'A school for all' encounters neo-liberal policy* (pp. 35–55). Dordrecht: Springer.

<sup>87</sup> Blossing, U., & Söderström, A. (2014). A school for every child in Sweden. In U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic education model. 'A school for all' encounters neo-liberal policy* (pp. 17–34). Dordrecht: Springer.

<sup>88</sup> Alexiadou, N., Dovemark, M., Erixon-Arreman, I., Holm, A.-S., Lundahl, L., & Lundström, U. (2016). Managing inclusion in competitive school systems: The cases of Sweden and England. *Research in Comparative & International Education*, 11(1), 13–33.

The long-admired Swedish welfare state that emphasised the building of citizenship and the creation of a democratic society has transformed towards individualised notions of responsibility, freedom of choice, and local variation. Schooling reforms since the 1990s have intensified curricular and institutional differentiation, and legitimised the principle of diversity in a marketised system. The traditional emphasis on collective participation and the achievement of equality in and through schooling have weakened through decentralisation processes and individualisation, in what has been described as an alternative 'narrative' of Sweden.<sup>89</sup> However, Sweden has retained strong elements of the social democratic ethos that are still visible in the functions, values, and governance of education.

The high level of school privatisation in Sweden has been accompanied by a management of performance within schools, especially through measures by the Swedish National Agency for Education (SNAE) and the new Swedish Schools Inspectorate that has more extensive policy powers and possibilities for imposing sanctions than its predecessor.<sup>90</sup> In addition, during the 2000s grading and national testing has increased considerably from an initially modest level. The National Agency has since 2001 used an information system (SIRIS) of quantitative information on national test results and grades, and qualitative information consisting mainly of Inspectorate reports. The segregation processes have been an important consideration.<sup>91</sup>

The school choice reform in Sweden began almost 25 years ago including the private schools<sup>92</sup>, and the municipalisation of the management of the school system<sup>93</sup> has transformed Sweden's educational system into one of the most decentralised in the world.<sup>94</sup> Urban spaces, polarised by class and ethnicity, structure the basic conditions of emerging local school markets. The distribution of symbolic capital, or 'hot knowledge' of the market, affects

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<sup>89</sup> Lindgren, J. (2010). Spaces of social inclusion and exclusion. A spatial approach to education restructuring and identity in Sweden. *Education Inquiry* 1(2): 69–89.

<sup>90</sup> Rönnberg, L. (2012). Reinstating national school inspections in Sweden: The return of the state. *Nordic Studies in Education*, 32(2), 69–83.

<sup>91</sup> Trumberg, A. (2011). *Den delade skolan: segregationsprocesser i det svenska skolsystemet* [The divided school: Processes of segregation in the Swedish school system]. Doctoral dissertation, Örebro Universitet, Örebro.

<sup>92</sup> SOU (2013:56). *Friskolorna i samhället* [Free schools in society]. Stockholm: Utbildningsdepartementet.

<sup>93</sup> SOU (2014:5). *Staten får inte abdikera – om kommunaliseringen av den svenska skolan* [The state cannot abdicate – Regarding municipalisation of the Swedish school]. Betänkande av Utredningen om skolans kommunalisering. Stockholm: Utbildningsdepartementet.

<sup>94</sup> Blomqvist, P., & Rothstein, B. (2005). *Välfärdsstatens nya ansikte, demokrati och marknad inom den offentliga sektorn* [The new face of welfare state, democracy and market within the public sector]. Stockholm: Agora.

schools, the market, and the urban spaces themselves. A conclusion from an ethnographic study is that despite nationally defined principles mandating fairness, transparency, and integration, school choice policies are implemented on an uneven playing field, aggravating current patterns of segregation in education and even housing.<sup>95</sup> Some scholars have identified school choice as a driving force behind increased school segregation,<sup>96, 97</sup> while others implicate housing segregation, lowered educational standards, and weak pedagogical models as reasons for school segregation.<sup>98, 99, 100</sup> Moreover, increased segregation with respect to student composition and academic outcomes across different schools has been found to be the main source of the declining educational equity.<sup>101</sup>

## Norway

A social democratic, egalitarian public sector and a corporatist political economy have been strong, distinctive, and enduring characteristics of Norwegian education. However, the education sector in Norway has experienced a period of rapid and extensive implementation of New Public Management (NPM) reforms and post-NPM reforms in the past 15 years.<sup>102</sup> Since 2005 the government has added new ideas of governance and implemented new methods of steering education in line with post-NPM reforms. New measures for input control have been adopted, and the negative effects of marketisation have to some degree been moderated by later educational reforms. From a Scandinavian perspective, Norwegian education has showed a reluctance and resistance to change, but at the beginning of the 2000s it experienced a period of rapid and extensive implementation of NPM reforms. An important question is how such changes influence the

<sup>95</sup> Nihad Bunar, N., & Ambrose, A. (2016). Schools, choice and reputation: Local school markets and the distribution of symbolic capital in segregated cities. *Research in Comparative & International Education*, 11(1), 34–51.

<sup>96</sup> Gustafsson, J.-E., & Yang-Hansen, K. (2009). *Resultatförändringar i svensk grundskola. Vad påverkar resultaten i svensk grundskola? Kunskapsöversikt om betydelsen av olika faktorer*. [Changing results in the Swedish primary schools. What influences the results? Review of importance of different factors]. Stockholm: Skolverket.

<sup>97</sup> Östh, J., Andersson, E., & Malmberg, B. (2012). School choice and increasing performance difference: A counterfactual approach. *Urban Studies* 50(2), 407–425.

<sup>98</sup> Böhlmark, A., & Lindahl, M. (2007). *The impact of school choice on pupil achievement, segregation and costs: Swedish evidence*. IZA Discussion Paper nr 2786. Bonn: Forschungsinstitut zur Zukunft der Arbeit (IZA).

<sup>99</sup> Edmark, K., Frölich, M., & Wondratschek, V. (2014). *Sweden's school choice reform and equality of opportunity*. Uppsala: IFAU

<sup>100</sup> Lindbom, A. (Ed.). (2007). *Friskolorna och framtiden – segregation, kostnader och effektivitet* [Free schools and the future – Segregation, costs and efficiency]. Stockholm: Institutet för Framtidsstudier.

<sup>101</sup> Hansen, L. Y., & Gustafsson, J.-E. (2019). Identifying the key source of deteriorating educational equity in Sweden between 1998 and 2014. *International Journal of Educational Research*, 93, 79–90.

<sup>102</sup> Helgøy, I., & Homme, A. (2016). Educational reforms and marketization in Norway – A challenge to the tradition of the social democratic, inclusive school? *Research in Comparative & International Education*, 11(1), 52–68.

professionalism of teachers.<sup>103</sup> Another question is whether the change in government implies a new shift in educational policies and whether NPM reforms will regain their dominant status. The significance of the change in government for social inclusion in education remains to be explored.<sup>104</sup>

## Finland

After the Second World War, the idea of equity gained momentum in Europe. In Finland, an equal opportunity to pursue a good life with education as a resource was also strengthened by the fact that ordinary people and the elites had fought side by side in the war.<sup>86</sup> Finland was the last Nordic country to undertake the comprehensive reform; a 1959 governmental committee proposed a common nine-year-long free-of-charge school with a uniform curriculum and with only partial streaming into ability groups. The reform was meant to make educational achievement independent of a child's gender and socioeconomic and geographical background.

Children with special needs benefitted from the remedial educational services inherent in the comprehensive school system. Among the goals of Finnish school policy has been the availability of a trustworthy neighbourhood school, and the goal was in fact reinforced by the school law of 1999 where it was recognised as the subjective right of every child. However, 'the primary schools became competitive instead of equal, selective instead of common and measured instead of trusted. In international comparison, they still were relatively equal, but the trend since 1990s was towards the ethos of competition.'<sup>105</sup>

## Denmark

A School for All has been a dominant vision in Denmark for more than a century.<sup>106</sup> The Danish Folkeskole is a 10-year, non-streamed comprehensive school with several options for streaming pupils for shorter periods of time. However, the 2006 act on the Folkeskole turned the objective of schooling away from education for everybody and participatory democracy towards education for an excellent, talented workforce. But it was differentiated teaching, rather than differentiated classes that was central to the

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<sup>103</sup> Helgøy, I., & Homme, A. (2007). Towards a new professionalism in school? A comparative study on teacher autonomy in Norway and Sweden. *European Educational Research Journal*, 6(3), 232–249.

<sup>104</sup> Lindberg, K., Czarniawska, B., & Solli, R. (2015) After NPM? *Scandinavian Journal of Public Administration*, 19(2), 3–6.

<sup>105</sup> Arhonen, S. (2014). A school for all in Finland. In U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic education model. 'A school for all' encounters neo-liberal policy* (p. 91). Dordrecht: Springer.

<sup>106</sup> Rasmussen, A., & Moos, L. (2014). A school for less than all in Denmark. In U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic education model. 'A school for all' encounters neo-liberal policy* (pp. 57–75). Dordrecht: Springer.

comprehensive school. A political focus was on accountability, or outcomes as measured in studies like PISA. There has been a development from welfare state to competitive state, but there has also been an advance in social justice in the comprehensive non-streamed schooling. It is necessary that a School for All can adapt structurally to the needs of modern society which includes the development of talents of all children and achieving differentiated teaching. It is nevertheless a challenge that more parents are choosing private schools for their children (from 6% in the postwar era to 14% in 2010).

## Iceland

Iceland is on a similar route as the other Nordic countries, where privatisation has become an 'inevitable' part of the education system. Internal privatisation is shaping the sector, based on technical methods of delivering predetermined outcomes. External privatisation, in the form of educational programmes, is growing along with charter schools.<sup>107</sup> A part of the neoliberal agenda is to systematically blur or obscure the boundary between public and private, to weave itself into the fabric of daily life, and this is what has happened in most of the Nordic countries.<sup>108, 109, 110</sup> The implementation varies somewhat, but there are also similarities, especially along the early childhood spectrum.

The Icelandic preschool system has according to researchers been reshaped over the last 10 to 15 years: it has moved from being a financially homogenous system in terms of provision and funding towards a market-driven system. This has entailed: (a) more standardised objectives and output but concurrently a deregulation of the private sector, which is then able to choose customers and fuel school choice; (b) intensified neo-managerialism evident in the increased size of the preschools (for example, in 2000 the biggest preschool had 128 children but by 2014 the largest preschool had 211 children); (c) opening up provision to the private sector to run schools and programmes paid for by taxation. The growth of behavioural cookie-cutter programmes sold to schools is an indication of pedagogical standardisation and the rise of the SEN (special education needs) industry in Iceland.<sup>111</sup> Lastly, it has entailed

<sup>107</sup> Dýrfjörð, K., & Magnúsdóttir, B. R. (2016). Privatization of early childhood education in Iceland. *Research in Comparative & International Education*, 11(1), 80–97.

<sup>108</sup> Ahrenkiel, A., Nielsen, B. S., Schmidt, C., Sommer, F. M., & Warring, N. (2012). *Daginstitutionsarbejde og pædagogisk faglighed*. Frederiksberg: Frydenlund.

<sup>109</sup> Arnesen, A.-L., Lahelma, E., Lundahl, L., & Öhrn, E. (Eds.). (2014). *Fair and competitive? Critical perspectives on contemporary Nordic schooling*. London: Tufnell Press

<sup>110</sup> Lundahl, L., Erixon Arreman, I., Holm, A., & Lundström, U. (2013) Educational marketization the Swedish way. *Education Inquiry*, 4(3), 497-517.

<sup>111</sup> Tomlinson, S. (2012). The irresistible rise of the SEN industry. *Oxford Review of Education* 38, 267–286.

(d) corporatism in the preschool sector with the emergence of school chains and all kind of programmes that shape daily life within schools.

## Equal opportunities and vulnerability

As one of the key elements of the Nordic welfare model, education systems are based on the idea of providing equal educational opportunities, regardless of gender, social class, and geographic origin. Since the 1990s, Nordic welfare states have undergone a gradual but wide-ranging transformation towards a more market-based mode of public service delivery. Along this trajectory, the advent of school choice policy and the growing variation in the between-school achievement results have diversified the previously homogenous Nordic education systems.

A study has analysed how Finnish and Swedish local education authorities comprehend and respond to the intertwinement of the market logic of school choice and the ideology of equality.<sup>112</sup> The data consisted of two sets of in-depth thematic interviews with staff from the local providers of education, the municipal education authorities. The analysis discloses the ways in which national legislation has authorised municipal authorities to govern the provision of education.

The concept of vulnerability is also relevant for the discussion of marketisation of the educational system.<sup>113</sup> Extensive investments have been made in every European Union (EU) country to reintegrate young people considered 'vulnerable' or 'at risk' of social exclusion into education and work.<sup>114</sup> A more critical examination of the operationalisation of the concept suggests that the ethos of vulnerability in social policy is strongly related to a bureaucratic attitude of patronising, selective systems of welfare, paternalism, and social control.<sup>115</sup> Frank Furedi<sup>116</sup> has argued that the popularity of vulnerability in Western societies has fostered 'a culture of fear', where the fear of risk has become central to our experiences of everyday life.

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<sup>112</sup> Varjo, J., Lundström, U., & Kalalahti, M. (2018). The governors of school markets? Local education authorities, school choice and equity in Finland and Sweden. *Research in Comparative & International Education*, 13(4), 481–498.

<sup>113</sup> Brunila, K., Ikävalko, E., Kurki, T., Mertanen, K., & Mikkola, A. (2016). Revisiting the vulnerability ethos in cross-sectoral transition policies and practices for young people in the era of marketisation of education. *Research in Comparative & International Education*, 11(1), 69–79.

<sup>114</sup> Brunila, K. (2014). The rise of survival discourse in the era of therapisation and neoliberalism. *Education Inquiry*, 5(1), 7–23.

<sup>115</sup> Brown, K. (2012). Re-moralising 'vulnerability'. *People, Place and Policy*, 6(1), 41–53.

<sup>116</sup> Furedi, F. (2003). *Therapy culture: Cultivating vulnerability in an uncertain age*. London: Routledge.

Authors have approached vulnerability as an ontological condition with a transformative potential to promote social justice and human rights.<sup>117, 118, 119</sup> Judith Butler<sup>120</sup> writes that vulnerability of a subject is a question of ontological precariousness of life. Vulnerability is often linked to the well-meaning approach of helping those 'less well off' in the society.<sup>121</sup> The policies and practices targeting vulnerable young people often resonate with good intentions. The school system needs to give equal opportunities, which means that the vulnerable individuals should also be given appropriate concern.

However, the traditional ethos on youth work concerning empowerment and voluntary participation is increasingly challenged by short-term interventions and ideologies and practices responding to social problems as individualised risks and problems. The role of education seems to be slipping away from knowledge-based education to skills training and even towards infantilisation, which Frank Furedi has pointed out in his book *Wasted: Why education isn't educating*.<sup>122</sup> More policy and professional discourses insist that young people must develop competences of resilience, self-discipline, and continuous self-development.<sup>123, 124</sup> The shift of responsibility from social/society to individual has increased vulnerability. This is especially evident in the sphere of working life, where workers have been considered disposable without obligation on the part of the 'social fabric' to take care of them.

## Nordic localism

After a period of centralisation since the 1930s, 'traditional Nordic localism' re-emerged during the 1980s.<sup>125</sup> Traditionally, vesting a high degree of decision-making in local authorities has been the central feature of school education in the Nordic countries.<sup>126, 127</sup> Nevertheless, before the 1990s, state regulation was considered

<sup>117</sup> Turner, B. (2006). *Vulnerability and human rights*. University Park, PA: Pennsylvania State University Press.

<sup>118</sup> Brown, K. (2011). 'Vulnerability': Handle with care. *Journal of Ethics and Social Welfare*, 5(3), 313–321.

<sup>119</sup> Ecclestone, K., & Goodley, D. (2014). Political and educational springboard or straitjacket? Theorising post/human subjects in an age of vulnerability. *Discourse: Studies in the Cultural Politics of Education*, 37(2), 175–188. <https://doi.org/10.1080/01596306.2014.927112>

<sup>120</sup> Butler, J. (2009). *Frames of war: When is life grievable?* London: Verso.

<sup>121</sup> Brown, K. (2014). Questioning the 'vulnerability zeitgeist': Care and control practices with 'vulnerable' young people. *Social Policy and Society*, 13(3), 1–17.

<sup>122</sup> Furedi, F. (2009). *Wasted: Why education isn't educating*. London & New York: Continuum International Publishing Group.

<sup>123</sup> Bottrell, D. (2009). Understanding 'marginal' perspectives. Towards a social theory of resilience. *Qualitative Social Work: Research and Practice* 8(3), 321–339.

<sup>124</sup> Walther, A. (2006). Regimes of youth transitions: Choice, flexibility and security in young people's experiences across different European contexts. *Young*, 14(2), 119–139.

<sup>125</sup> Green, A., Wolf, A., & Leney, T. (1999). *Convergence and divergence in European education and training systems*. London: Institute of Education, University of London.

<sup>126</sup> Arnesen, A.-L., & Lundahl, L. (2006). Still social and democratic? Inclusive education policies in the Nordic welfare states. *Scandinavian Journal of Educational Research* 50(3), 285–300.

<sup>127</sup> Esping-Andersen, G. (1990). *The three worlds of welfare capitalism*. Cambridge: Polity Press.

essential for the sake of equality.<sup>128</sup> During recent decades, decentralisation and new public management practices have increased local autonomy, which has also led to inter-municipal fragmentation. This trajectory has weakened the unifying structural principles upon which the comprehensive systems were built.<sup>127,129</sup> As one of the key elements of the Nordic welfare model,<sup>128</sup> the comprehensive school system is based on the idea of providing equal educational opportunities, regardless of gender, social class, and geographic origin.

In tandem with the 'changing central–local relations of governance', Nordic welfare states are undergoing a gradual but wide-ranging transformation towards a more market-based mode of public service delivery. The municipalities in general – and local education authorities in particular – operate in the intersection between the imperative of school markets and the aversion to inequality. Due to the situation in which the performance of both Finland and Sweden in the PISA survey has declined in recent years,<sup>130</sup> the municipal interpretations and actions to improve quality and equality in education have gained in significance.

The political situations in which local education markets occur are dissimilar in the two countries. In Finland, school choice takes place within the public-school system, strictly provided and governed by public authorities. Classes with a special emphasis are the Finnish mechanism for exercising parental choice.<sup>131</sup> In contrast, the choice occurs both within and between the private and public sectors in Sweden. All schools, both public and private, compete for pupils and funding.<sup>130</sup> The number of independent schools – and the proportion of students involved – has risen markedly, driven by the rather unique ability of independent school owners to extract profits.

There are well-reported, differentiation-related downsides of choice, such as increased interschool variance in student achievement.<sup>132, 133</sup>

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<sup>128</sup> Page, E., & Goldsmith, M. (Eds.). (1987). *Central and local relations*. London: SAGE.

<sup>129</sup> Varjo, J., Kalalahti, M., & Lundahl, L. (2016). Recognizing and controlling the social cost of school choice. In B. Pink, & G. Noblitt (Eds.), *Education, equity and economy: Studies toward the future of socially just education* (73-94). Heidelberg: Springer. DOI: [10.1007/978-3-319-21644-7\\_4](https://doi.org/10.1007/978-3-319-21644-7_4)

<sup>130</sup> OECD. (2016). *PISA 2015 results: Excellence and equity in education* (Volume I). Paris: OECD.

<sup>131</sup> Seppänen, P., Kalalahti, M., Rinne, R., & Simola, H. (Eds.). (2015). *Lohkoutuva peruskoulu: Perheiden kouluvaihto, yhteiskuntaluokat ja koulutuspolitiikka* [Segmenting comprehensive school: School choices, social classes and education politics]. Research in Educational Sciences 68. Jyväskylä: Finnish Educational Research Association.

<sup>132</sup> Bernelius, V., & Kauppinen, T. M. (2011). School outcomes and neighbourhood effects: A new approach using data from Finland. In M. van Ham, D. Manley, N. Bailey, L. Simpson, & D. Maclennan (Eds.), *Neighbourhood effects research: New perspectives* (pp. 225–247). London: Springer.

<sup>133</sup> Östh, J., Andersson, E., & Malmberg, B. (2013). School choice and increasing performance difference: A counterfactual approach. *Urban Studies*, 50(2), 407–425.

Swedish researchers<sup>134</sup> claim that in the Swedish case, this problem is caused mainly by residential segregation but also by the increased number of independent schools. A Swedish doctoral dissertation<sup>135</sup> concluded that school choice results in schools that are internally more homogenous and externally more segregated in terms of socioeconomic background and ethnicity.

## NordForsk investing in Education for Tomorrow

The programme of Education for Tomorrow was initiated in 2013 by NordForsk, an organisation under the Nordic Council of Ministers. Several large-scale, interdisciplinary research projects and one Nordic Centre of Excellence, JustEd,<sup>136</sup> were funded in the first phase in 2013–2018. The aim was to generate new knowledge about the Nordic educational systems to better equip the Nordic countries to meet the needs of society – today and in the future.

The Nordic Centre of Excellence, JustEd,<sup>137</sup> conducts research in three thematic areas: (i) Governance, politics, and marketisation changes in the Nordic understanding of justice through education; (ii) Justice through educational practices? Analysing innovative cultures of teaching and learning in Nordic contexts; and (iii) Enabling and constraining justice in education: agency, marginalisation, and diversity.

The research projects in the first phase of the programme have now been completed and have generated new knowledge on a broad range of themes.<sup>138</sup> Three themes have been specifically reported:

1. Market-based and privatisation policy reforms in education do not support the social, regional, and institutional equality that is central to the Nordic model. This includes considering two sub-themes:

‘(1.1) Policymakers at national and local levels need to actively prevent and counteract the effects of school choice policies that lead to social segregation between and within schools; and (1.2) Policymakers need to see higher education as a public good and

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<sup>134</sup> Holmlund, H., Häggbom, J., Lindahl, E., Martinson, S., Sjögren, A., Vikman, U., & Öckert, B. (2014). Decentralisering, skolval och fristående skolor: Resultat och likvärdighet i svensk skola [Decentralisation, school choice and independent schools. Results and equity in the Swedish school]. Report 2014:25. Stockholm: Institutet för arbetsmarknads- och utbildningspolitisk utvärdering.

<sup>135</sup> Trumberg, A. (2011). *Den delade skolan. Segregationsprocesser i det svenska skolsystemet* [Divided schools. Processes of segregation in the Swedish school system]. Örebro Studies in Human Geography 6. Örebro: Örebro University.

<sup>136</sup> <http://www.justed.org/>

<sup>137</sup> <http://www.justed.org/research-focuses/>

<sup>138</sup> Education for tomorrow. How do we get there? Policy implications for phase 1. <http://norden.diva-portal.org/smash/get/diva2:1304397/FULLTEXT01.pdf>

provide uniformly high-quality resources to higher education institutions in order to limit the effects of market-driven funding and steering policies on institutional stratification and social bias in access.'

2. For teachers, pupils, and schools to promote equity in education, discrimination and marginalisation need to be addressed specifically and explicitly in local and national curricula, other steering documents, as well as in teacher education. This includes three sub-themes:

'(2.1) Teachers need knowledge and tools to identify, challenge, and change norms and power structures in order to prevent marginalization and to support inclusion; (2.2) Educational marginalization based on disability, social class, gender, ethnicity, as well as stigmatization of residential areas need to be explicitly addressed in educational policy, research, and practice; (2.3) Knowledge about gender and sexuality needs to be integral to teacher education, and resources are needed for teachers and schools for promoting gender sensitivity.'

3. The challenge of balancing the pacing of content coverage, while at the same time providing flexibility and allowing room for student initiative and active engagement in the classroom, needs to be addressed in order to provide a quality education for pupils. This also includes three sub-themes:

'(3.1) The Nordic educational systems would benefit from knowledge-sharing on pupil participation models; (3.2) Upper secondary school students need more opportunities for initiative, autonomy, and influence over their education, both at the class and school levels; (3.3) The use of digital technologies and social media in secondary education must be carefully structured and reflexively adapted to finding a balance between ensuring all students equal educational access to learning-relevant content and participation in learning-relevant classroom discourse.'

The evaluation conducted by Oxford Research of NordForsk's Education for Tomorrow Programme Phase I highlights some achievements:<sup>139</sup> (1) The programme's main impact is scientific, i.e. a large number of scientific publications, achieving a high number of citations and international co-authorships; (2) The programme's societal impact is limited; (3) The programme's Nordic added value is high but there is less evidence that the programme has strengthened

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<sup>139</sup> <https://old.nordforsk.org/files/evaluation-of-education-for-tomorrow-phase-1>

the Nordic region's position in educational research; and (4) A gender perspective permeates the programme.

Oxford Research also suggested that NordForsk considers the following points when designing possible future research efforts within educational research:<sup>140</sup> (1) Determine the focus of the programme and steer actively towards it, find a focus where theory-oriented and practice/policy-oriented research converge, allowing that focus to guide NordForsk's priorities; (2) Clarify the concept of Nordic added value; (3) Articulate how the results from the programme will feed back to stakeholders outside academia; (4) Strengthen coherence within future programmes including an operative leadership function at the programme level, limiting the programme's thematic scope and more thematic synergies within the programme; (5) Improve consistency and coherence in reporting; and (6) Retain flexibility in the implementation of future programmes.

Phase II of the Education for Tomorrow programme builds on the foundation laid in the first phase. The programme focus is on bridging research with practice in the area of teaching and learning<sup>140</sup> with emphasis on the application of research-based knowledge in practice in genuinely collaborative projects. Another focus is the role of teacher education for research-based development of practice. Phase II of the programme covers early childhood education and care, primary education, and teacher education. Targeted themes in phase II are: (i) Teaching and learning processes and student engagement; (ii) Inclusive and multilingual education, (iii) Adaptive learning, digital technologies, and use of media; (iv) Teacher education and professional development; and (v) School environment, well-being, and interaction with local communities. Phase II is funded by approximately NOK 50 million.

A part of the Education for Tomorrow programme is another Nordic Centre of Excellence 'Quality in Nordic Teaching' (QUINT) at Oslo University,<sup>141</sup> which will focus on teaching quality in Nordic classrooms and will ask questions such as: How does teaching make a difference to student learning and engagement across and within school subjects, with and without digital-rich support, in mono- and multicultural contexts across the Nordic countries? How can

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<sup>140</sup> *Education for Tomorrow – Phase II. Bridging research and practice in the area of teaching and learning.*  
[https://old.nordforsk.org/en/publications/publications\\_container/education-for-tomorrow-2013-phase-ii-br](https://old.nordforsk.org/en/publications/publications_container/education-for-tomorrow-2013-phase-ii-br)

<sup>141</sup> <https://www.nordforsk.org/en/programmes-and-projects/projects/nordic-centre-of-excellence-quality-on-nordic-teaching-quint>  
<https://www.uio.no/quint/english/about/>

classroom videos be effective tools in teacher training? Does the use of video technology and other digital systems generate potential for new forms of collaborative research between researchers and practitioners? Studies indicate that there are significant differences between schools when researchers observe the practices of teachers and interactions in classrooms. There is hence a need for systematic and comparative research efforts to go deeper and broader into these patterns that also consider the changing landscape of Nordic schools, such as the digitalisation of learning processes and a stronger multicultural profile. An overarching theme for the QUINT Centre is the use of video in new forms of collaborative research that enable productive and concrete discussions about improvements in teaching practices. Instrumental for this endeavour is the QUINT partnership of working together with highly reputed international scholars.

## Knowledge gaps and concerns

- The dynamic development of the school systems in the Nordic countries offers opportunities for comparative research and quasi-experimental studies related to most policy issues discussed in Introduction 2.
- Development of a strategy for education policy renewal should include pilot studies where implementation, effects, and sustainability are evaluated by advanced research methods such as appropriate mixed-methods approaches. If possible, these studies could include participatory approaches and involvement of school professionals at the school level.
- The Nordic countries have a unique infrastructure and competence for doing registry studies. This should be put to further use in educational research and policymaking. By merging different types of registries – in education, health, welfare, and sociodemographic registries – it is possible to address more research and policy issues.
- Although the NordForsk investment in education is an important effort, additional funding is needed for Nordic comparative studies and Nordic research collaboration for generating knowledge related to socioeconomic, gender, and health inequalities and how these interact in generating inequalities in school achievement and school attainment.

- A comparative longitudinal study could be initiated where a small sample of schools at preschool, primary, and secondary levels from the Nordic countries are developed as a 'policy laboratory'. This initiative could systematically investigate relevant changes in educational policy and practices.

# 1. School achievement

During the last decades, the levels of educational achievement reached by both individual students and educational systems have increasingly come into focus. Setting standards for school achievement targets crucial societal objectives by defining educational benchmarks at different achievement levels.<sup>142</sup> This could provide feedback to policymakers, schools, and teachers about the strengths and weaknesses of a school system. Standard setting therefore needs to be accurate, reliable, valid, useful, and defensible. There is a lack of studies on standard setting in the Nordic countries, where the number of national tests is increasing, and there are concerns about the time and effort spent on testing at schools without feedback being provided.

The development of school achievement in the Nordic countries has recently been analysed using published results on literacy and numeracy from the international large-scale assessments (ILSAs) in 1964–2012.<sup>143</sup> Such studies have grown in terms of number of participants and frequency of repetition.<sup>144</sup> The analysis included the ILSAs done by the International Association for the Evaluation of Educational Achievement (IEA) in 1960–1990, the TIMSS repeated on a four-year cycle since 1995, and the PIRLS in grade 4 since 2001. In 2000, OECD carried out the first round of the PISA study, with a similar methodology as that used in the Third International Mathematics and Science Study (TIMSS) but with 15-year-olds. The PIAAC (Programme for the International Assessment of Adult Competencies) study was established in 2012 by the OECD to investigate literacy, numeracy, and problem-solving skills among adults in the age range of 16–65. The goal of PIAAC is to assess and compare the basic skills and the broad range of competencies of adults around the world. The assessment focuses on cognitive and workplace skills needed for successful participation in 21st-century society and the global economy.<sup>145</sup>

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<sup>142</sup> Blömeke S., & Gustafsson J. E. (2017). Introduction. In S. Blömeke & J. E. Gustafsson (Eds.), *Standard setting in education. Methodology of educational measurement and assessment*. Springer.

<sup>143</sup> Gustafsson, J. E., & Blömeke, S. (2018). Development of school achievement in the Nordic countries during half a century. *Scandinavian Journal of Educational Research*, 62(3), 386–406.  
<https://doi.org/10.1080/00313831.2018.1434829>

<sup>144</sup> Gustafsson, J.-E. (2008). Effects of international comparative studies on educational quality on the quality of educational research. *European Educational Research Journal*, 7(1), 1–17.  
<https://doi.org/10.2304/eeerj.2008.7.1.1>

<sup>145</sup> <https://nces.ed.gov/surveys/piaac/>

The analysis of published results concerning literacy and numeracy from the international large-scale assessments between 1964 and 2012 in Denmark, Finland, Norway, and Sweden resulted in several important conclusions. For most countries, a small but consistent increase in the level of achievement was observed from the mid-1970s to around 1990 for both literacy and numeracy. Finland improved on literacy performance dramatically between the mid-1980s and the mid-1990s. For all countries, performance declined from the late 1990s/early 2000s, which is hypothesised to be due to different factors in different countries.

There were different opinions about the reasons behind the improvement of literacy performance in Finland. The analysis by Gustafsson and Blömke supports the hypothesis that the successively developed part-time special education which focuses on reading and writing skills during the first years of schooling is a reason behind the unique improvement of literacy performance in Finland.<sup>146</sup> Another analysis made by Sahlgren rejected the hypothesis that the Finnish comprehensive school reform, which was successively introduced during the 1970s, was behind the high-performance level in PISA.<sup>147</sup> Instead, according to Sahlgren, Finland's success appears to be the result of deep-rooted historical, socioeconomic, and cultural factors, combined with a resistance to the rising global tide of progressive teaching methods.

## School achievement according to PISA

Until the end of the 1990s, the OECD's comparisons of education outcomes were mainly based on the unreliable indicator of years of schooling. The Programme for International Student Assessment (PISA), however, tests the knowledge and skills of students directly, through a metric that was internationally agreed upon. Data from students, teachers, schools, and systems are linked to facilitate understanding performance differences within and between countries.

The aim with PISA was not 'to create another layer of top-down accountability, but to help schools and policy makers shift from looking upward within the education system towards looking outward to the next teacher, the next school, the next country.' PISA counts what counts and makes that information available to educators and policymakers so they can make more informed

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<sup>146</sup> Kivirauma, J., & Ruoho, K. (2007). Excellence through special education? Lessons from the Finnish school reform. *Review of Education*, 53(3), 283–302. <https://doi.org/10.1007/s11159-007-9044-1>

<sup>147</sup> Heller-Sahlgren, G. (2015). *Real Finnish lessons: The true story of an education superpower*. London: Centre for Policy Studies.

decisions.<sup>148</sup> Data from PISA are used in education policy formulations in many countries, but mostly as grey literature and not scientific articles.<sup>149,150</sup>

A review of lessons learned from PISA reported three types of publications:<sup>151</sup> (1) secondary analysis which shows inequalities related to socioeconomic status such as SES gaps, role of systemic characteristics such as early forms of selection, and forms of educational freedoms that magnify the compositional SES effects, and the role of the family; (2) critique of PISA including the cognitive test constructs, design, and technical issues (sampling, bias, translation, curriculum, and cultural fairness); and (3) policy and impact (144 articles).

The national trends in the seven rounds of data collection in the PISA study have generated important knowledge, which has created political momentum for investment in education. It is therefore of great interest to look at the national trends. Some 600,000 students completed the assessment in 2018. In the Nordic countries many students participated: In Denmark 7657 students from 371 schools completed the assessment, in Finland 5649 students from 214 schools, in Iceland 3292 students from 140 schools, in Norway 5813 students from 254 schools, and in Sweden 5504 students from 227 schools.

### Denmark<sup>152</sup>

Students in Denmark scored higher than the OECD average in reading, mathematics, and science. The mean performance in reading remained stable, around a flat trend line, during the seven rounds of PISA (figure 2). No overall direction of the trend could be detected for either mathematics or science. However, in mathematics, a declining trend up to 2012 was followed by a recovery during 2012–2018. The performance in science in 2018 was lower on average than in 2015 (about nine score points). Moreover,

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<sup>148</sup> Schleicher, A. (2019). *PISA 2018. Insights and interpretations*. OECD.  
<http://www.oecd.org/pisa/PISA%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf>

<sup>149</sup> Baird, J., Johnson, S., Hopfenbeck, T. N., Isaacs, T., Sprague, T., Stobart, G., & Yu, G. (2016). On the supranational spell of PISA in policy. *Educational Research*, 58(2), 121–138. Special issue: International policy borrowing and evidence-based educational policy making: Relationships and tensions.

<sup>150</sup> Lindblad, S., Pettersson, D., & Popkewitz, T. S. (2015). *International comparisons of school results: A systematic review of research on large scale assessments in education*. Stockholm: Swedish Research Council.

<sup>151</sup> Hopfenbeck, T. N., Lenkeit, J., Masri, Y. E., Cantrell, K., Ryan, J., & Baird, J.-A. (2018). Lessons learned from PISA: A systematic review of peer-reviewed articles on the programme for international student assessment. *Scandinavian Journal of Educational Research*, 62(3), 333–353.  
<https://doi.org/10.1080/00313831.2016.1258726>

<sup>152</sup> [http://www.oecd.org/pisa/publications/PISA2018\\_CN\\_DNK.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_DNK.pdf)

the overall trend in mathematics performance was negative among the highest-achieving students (at the 90th percentile).

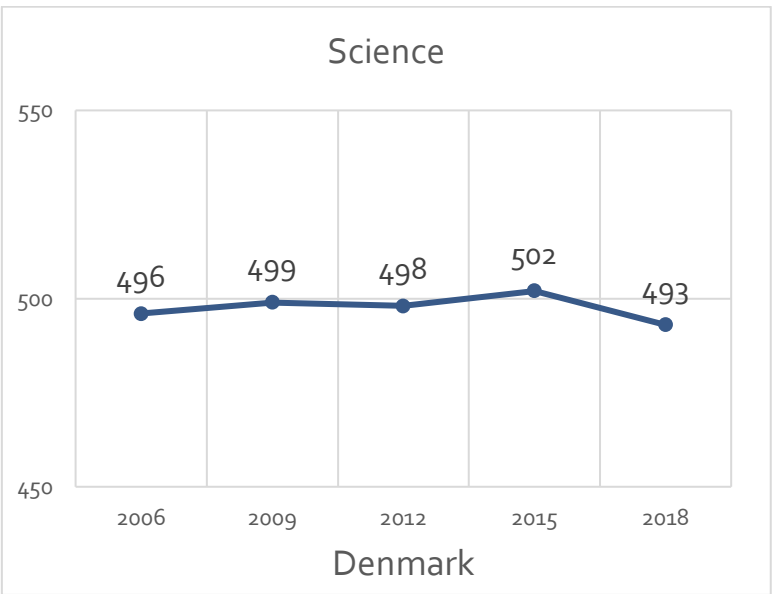
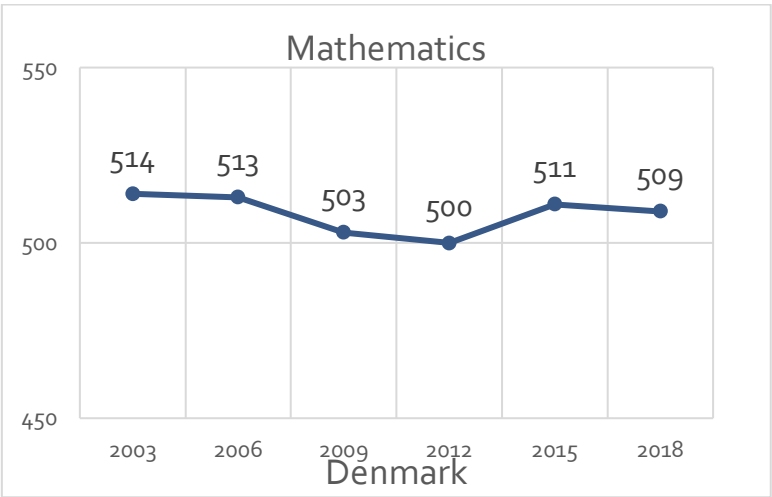
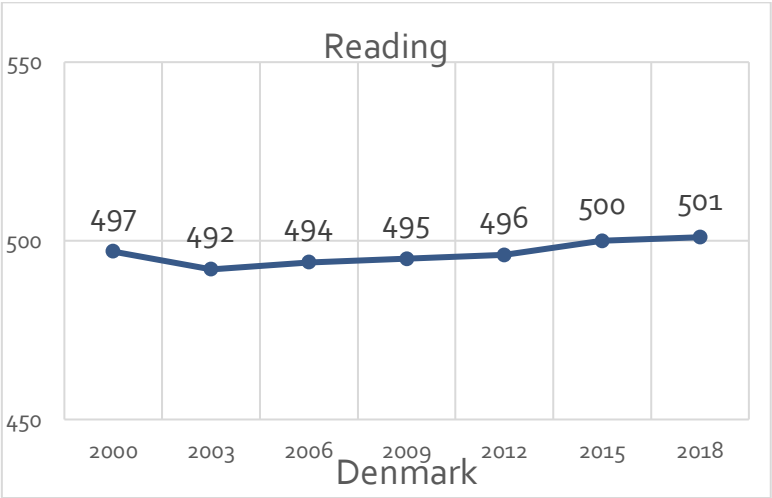
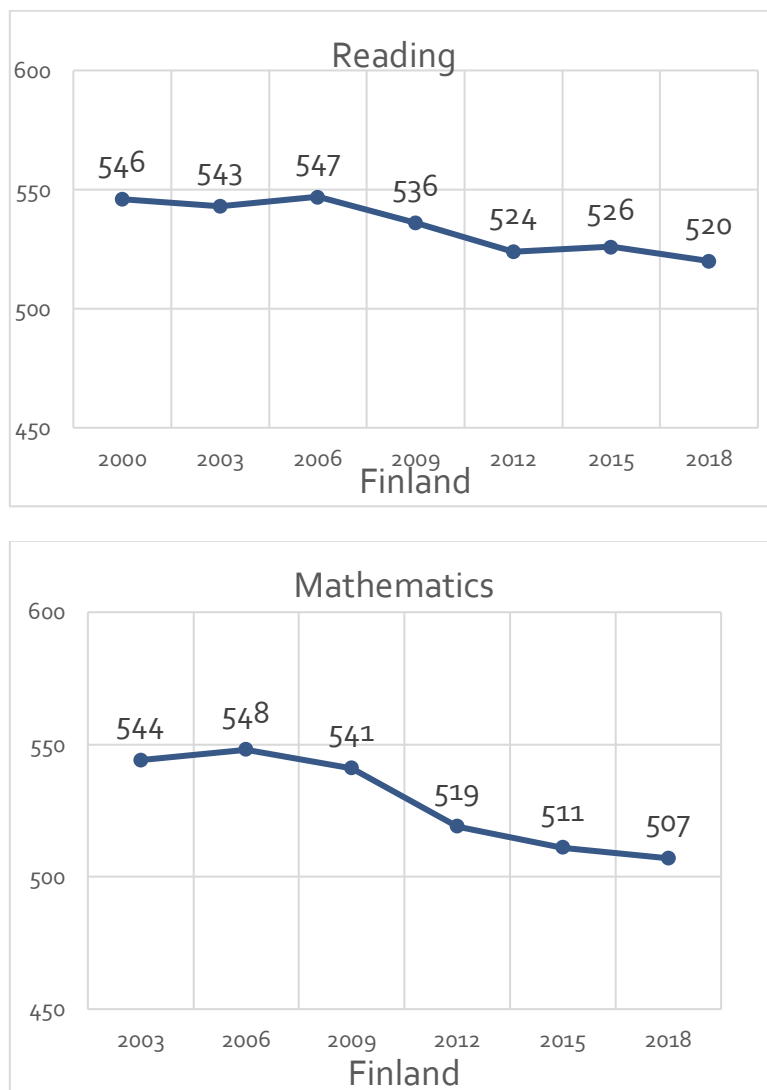


Figure 2: Trends in performance in reading, mathematics, and science in Denmark

### Finland<sup>153</sup>

Students in Finland scored higher than the OECD average in reading (520 score points), mathematics (507), and science (522). However, mean reading, mathematics, and science performance continued to decline (figure 3). In all three subjects the decline began after 2006, varying in the different subjects. In mathematics, declines were similarly rapid at all levels of the performance distribution while in reading and science, the declining trend was particularly noticeable among the lowest-achieving students.



<sup>153</sup> [http://www.oecd.org/pisa/publications/PISA2018\\_CN\\_FIN.pdf](http://www.oecd.org/pisa/publications/PISA2018_CN_FIN.pdf)

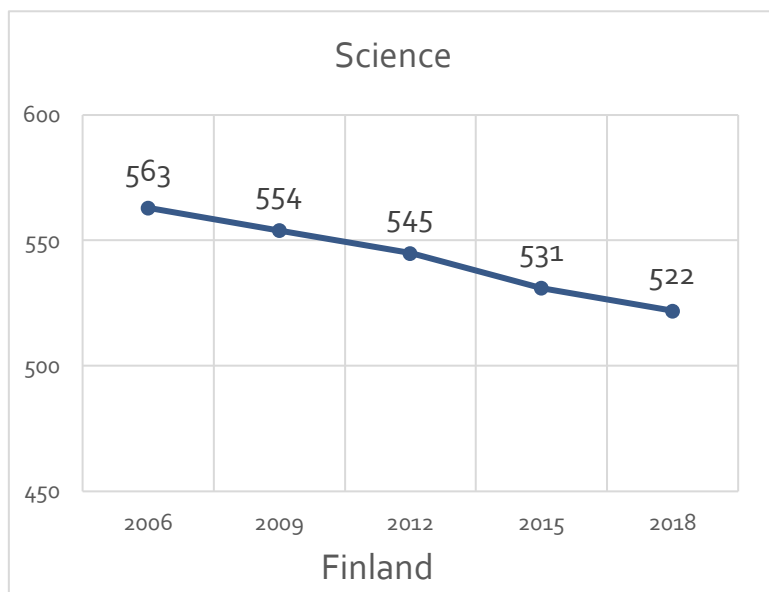
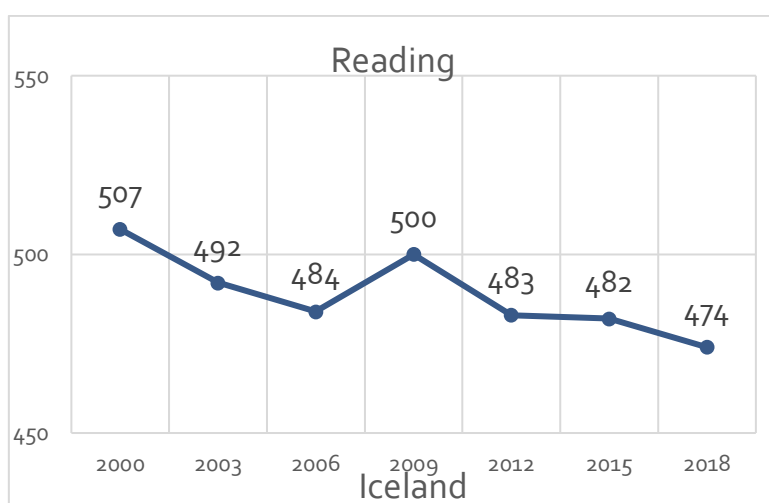


Figure 3: Trends in performance in reading, mathematics, and science in Finland

#### Iceland<sup>154</sup>

Students in Iceland scored lower than the OECD average in reading, higher than the OECD average in mathematics, and lower than the OECD average in science. The trend in mean performance in all three subjects declined by on average five score points per three-year period (figure 4). A partial recovery was seen in 2018 in the mean performance in mathematics, but this was not observed in reading or in science. The decline in performance in reading was seen among the country's lowest-achieving students (at the 10th percentile) but not among the highest-achieving students (at the 90th percentile).



<sup>154</sup> [https://www.oecd.org/pisa/publications/PISA2018\\_CN\\_ISL.pdf](https://www.oecd.org/pisa/publications/PISA2018_CN_ISL.pdf)

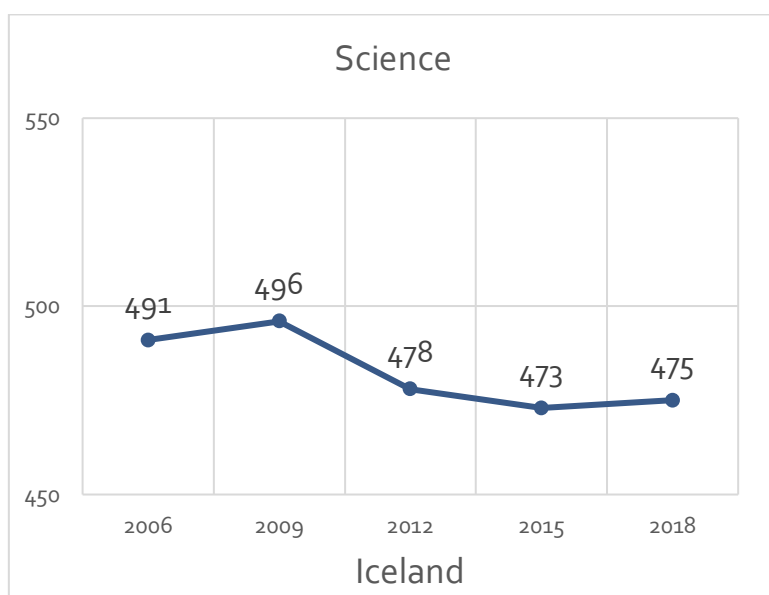
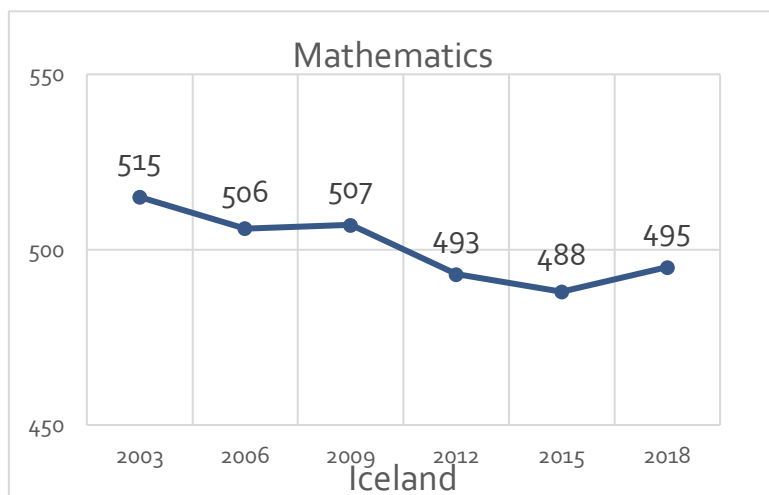


Figure 4: Trends in performance in reading, mathematics, and science in Iceland

#### Norway<sup>155</sup>

Students in Norway scored higher than the OECD average in reading and in mathematics but scored not significantly differently from the OECD average in science. No clear direction of change (neither positive nor negative) could be determined in any subject (figure 5). Moreover, trends over this longer period were similar at the top and at the bottom of the performance distribution.

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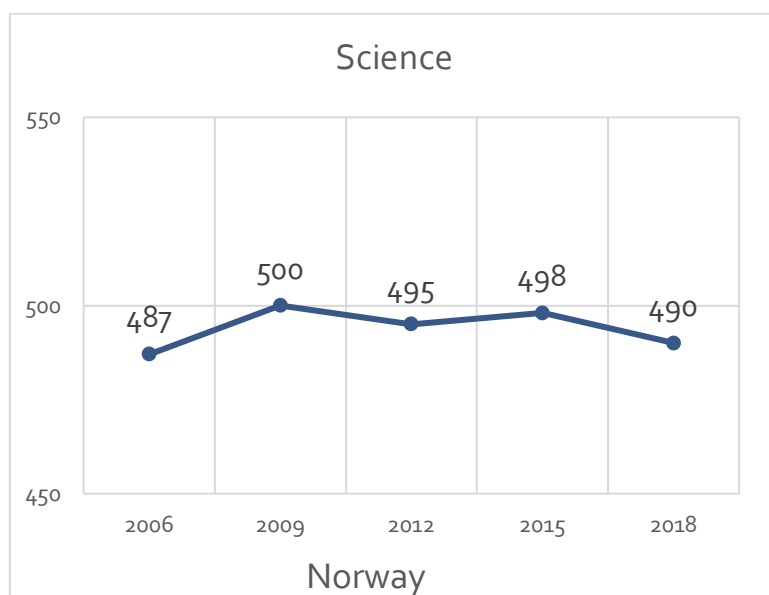
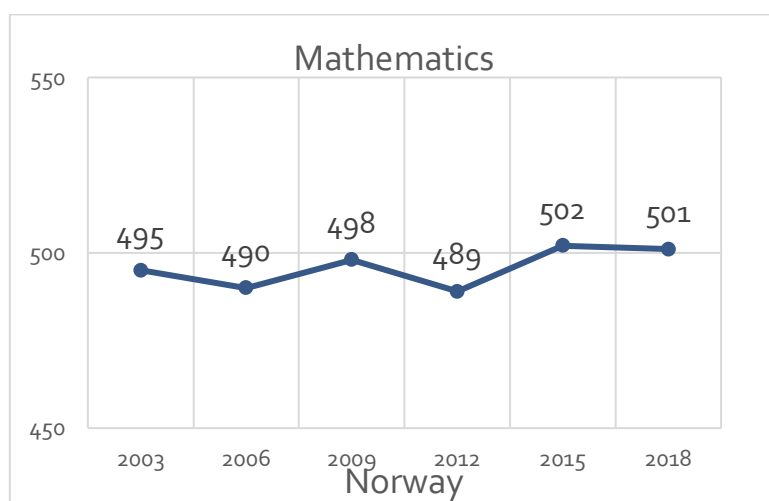
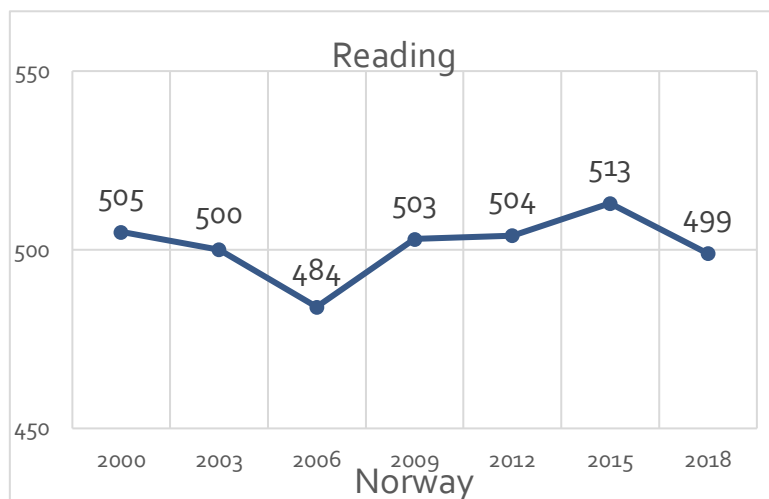
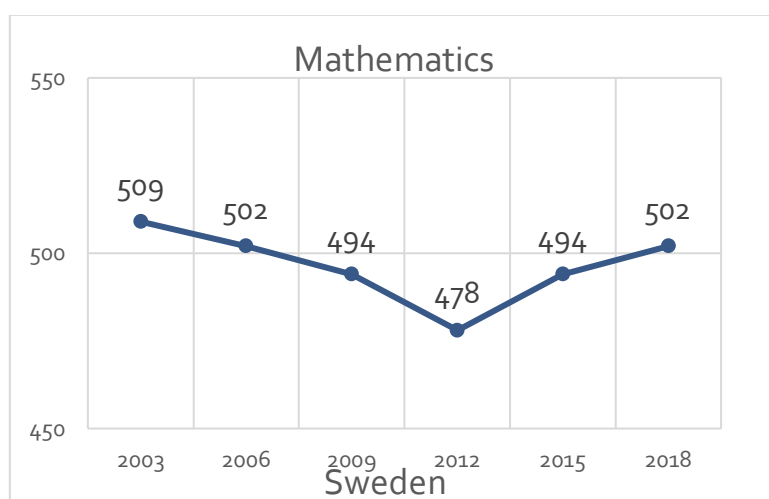
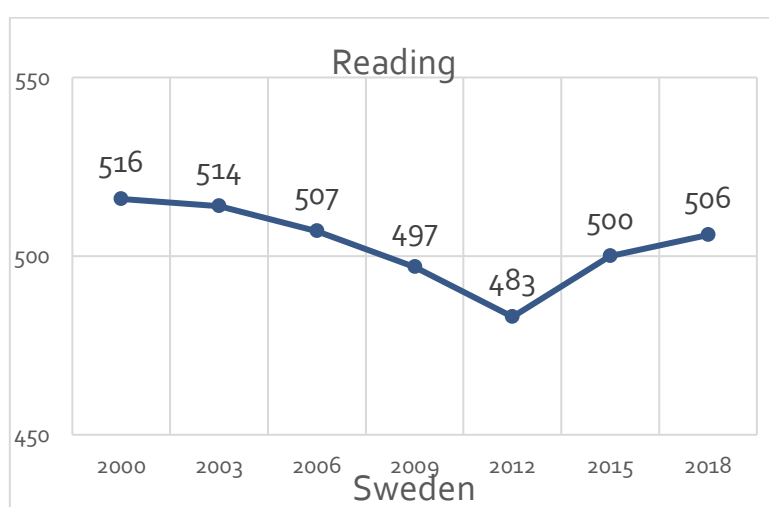


Figure 5: Trends in performance in reading, mathematics, and science in Norway

## Sweden<sup>156</sup>

Students in Sweden scored higher than the OECD average in reading (score points 506), mathematics (502), and science (499). After a rapid decline until 2012, mean reading, mathematics, and science performance in Sweden partially recovered between 2012 and 2018 (figure 6). In 2012–2018, the proportion of low-achieving students (scoring below Level 2) shrank by eight percentage points, and, at the same time, the proportion of top-performing students (scoring at Level 5 or 6) grew by about five percentage points. In reading and science, however, performance gaps widened over the long term. Performance decline was mainly seen among the lowest-achieving students, particularly in reading.



<sup>156</sup> [https://www.oecd.org/pisa/publications/PISA2018\\_CN\\_SWE.pdf](https://www.oecd.org/pisa/publications/PISA2018_CN_SWE.pdf)

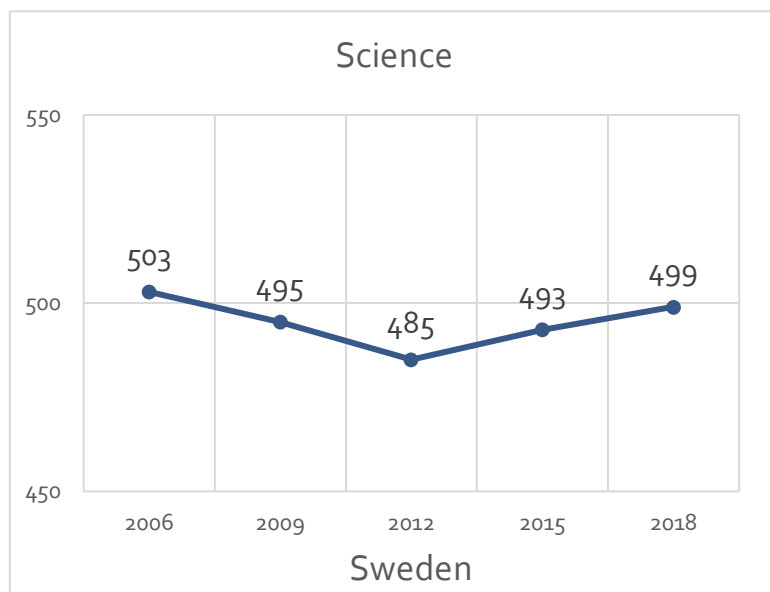


Figure 6: Trends in performance in reading, mathematics, and science in Sweden

### Comparison between the Nordic countries

The OECD has grouped the performance in PISA in six different levels.<sup>157</sup> The mean reading performance belongs to level 3 for Finland (mean score 520), Sweden (506), Denmark (501), and Norway (499), while Iceland (474) belonged to level 2. The ranking for mean scores in mathematics was at level 3 in all five countries: Denmark (509), Finland (507), Sweden (502), Norway (501), and Iceland (495). The mean score for science placed four countries at level 3: Finland (522), Sweden (499), Denmark (493), and Norway (490), while Iceland (475) belonged to level 4. These differences in mean level are in many cases small. Other ways to describe the situation are given in table 3, which also shows the proportion of top performers.

<sup>157</sup> Schleicher, A. (2019). *PISA 2018. Insights and interpretations*. OECD.  
<http://www.oecd.org/pisa/PISA%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf>

Table 3: What students know and can do in reading, mathematics, and science (PISA 2018) (%)

	Denmark	Finland	Iceland	Norway	Sweden	OECD
Proficiency in reading*	84	86	74	81	82	77
Top performers in reading**	8	14	7	11	13	9
Achievement in mathematics*	85	85	79	81	76	76
Top performers in mathematics**	12	11	10	12	13	11
Achievement in science*	81	87	75	79	81	78
Top performers in science**	6	12	4	7	8	7

\*= at least Level 2 in PISA test, \*\*= Level 5 or 6 in PISA test

International large-scale assessments have been developed into advanced machineries for producing data on educational systems for two main uses.<sup>158</sup> The first purpose is for evaluation and policy discussions within participating countries, and the second is to provide infrastructure for research.

The PISA study includes questions about the school climate. In the latest PISA survey, the Nordic countries were in several questions close to the OECD mean values (table 4), but in others the school climate has been rated better.

Table 4: School climate according to students in the Nordic countries (PISA 2018) (%)

	Dk	Fi	Ice	No	Se	OECD
Being bullied at least a few times a month	21	18	17	19	19	23
Agreed or strongly agreed that it is a good thing to help	92	91	88	93	90	88

<sup>158</sup> Gustafsson, J. E. (2018). Introduction: International large-scale assessments: Current status and ways forward. *Scandinavian Journal of Educational Research*, 62(3), 328–332.  
<https://doi.org/10.1080/00313831.2018.1443573>

students who cannot defend themselves						
In all or most language-of-instruction lessons, their teacher has to wait a long time for students to quiet down	14	27	24	22	26	26
Students had skipped a day of school in the two weeks prior to the PISA test	20	13	7	14	10	21
Students had arrived late for school in the last two weeks	48	45	50	49	53	48
Agreed or strongly agreed that their teacher shows enjoyment in teaching	83	69	79	77	78	74
Their schoolmates co-operate with each other	81	70	78	87	63	62
Their schoolmates compete with each other	43	59	53	69	52	50
Agreed or agreed strongly that they feel lonely in school	11	14	17	14	16	16

The PISA also included questions on the students' feelings about life and learning (table 5). The majority were satisfied with their lives and sometimes or always felt happy. Few were always feeling sad. About two-thirds hold a growth mindset (they disagreed or strongly disagreed with the statement 'Your intelligence is something about you that you can't change very much').

Table 5: Feelings about life and learning among students in Nordic countries (PISA 2018) (%)

	Dk	Fi	Ice	No*	Se	OECD
Satisfied with their lives	67	78	72		67	67
Sometimes or always feeling happy	91	91	91		88	
Always feeling sad	3	4	6		5	
Agreed or strongly agreed that they can usually find a way out of difficult situations	90	84	84		83	84
Agreed or strongly agreed that, when they fail, they worry about what others think of them	58	50	64		53	56
Holds a growth mindset	75	67	73		63	63

\*These questions were not included in the Norwegian data collection.

The PISA data include school children's responses that in a meaningful way can be used for analysing relationships between different factors and school achievement. However, there is the limitation that a cross-sectional study has in estimating the direction of influence. A repeated cross-sectional study such as the PISA has a strength in analysing trends among school children, which is an important asset.

An example of studies using ILSA is the analysis of educational policy for health equality that Heller-Sahlgren has done for the Nordic Welfare Centre.<sup>159</sup> A comparatively strong relationship was found between literacy and numeracy scores in the Programme for the International Assessment of Adult Competencies (PIAAC) from 2012 and the probability of being in full-time employment in the Nordic region. Moreover, the PIAAC scores were relatively strongly related to differences in self-assessed health in the Nordic countries. The relationship between parental education/immigrant status and self-assessed health in the region seems to be mediated by the

<sup>159</sup> Heller-Sahlgren, G. (2019). *Educational policy for health equality: Lessons for the Nordic region*. Stockholm: Nordic Welfare Centre. [https://nordicwelfare.org/wp-content/uploads/2019/05/Education-Policy-for-Health\\_FINAL.pdf](https://nordicwelfare.org/wp-content/uploads/2019/05/Education-Policy-for-Health_FINAL.pdf)

competences measured by the PIACC scores. This study also included an analysis of the possible impact of traditional education – in which knowledge and non-cognitive skills (such as grit) were key goals – and more progressive, child-centred ideas focused more on school enjoyment both as an end and as a means for higher achievement.

There is little doubt that Denmark, Iceland, Norway, and Sweden have implemented progressive practices to quite a large extent, while Finland in 2012 stands out as the country with the most traditional practices, despite increasingly official policy pushing in a progressive direction. Using PISA data from 2012, it seems that while pupil-centred methods induce more positive school experiences, they decrease pupils' academic performance. This may have an impact on health, but the conclusions rest on aggregated national data. It is nevertheless an important hypothesis for further studies. One policy recommendation from this study is: 'To decrease health disparities in the future, Nordic governments should consider altering their current education-policy trajectories in a more evidence-based direction.'<sup>160</sup>

## Knowledge gaps and concerns

- The international large-scale assessments offer unique data for analysis of factors related to school achievement. Using more advanced analytical strategies would improve the knowledge state, but the quality of relevance of the content in the assessment needs to be discussed in detail.<sup>161</sup>
- The analytical procedure should involve advanced forms of statistical multi-level analysis, as the national comparisons on the aggregated level often disregard within-country variation.
- There are many longitudinal studies of children from birth onwards. Mostly these studies focus on health and child development. These could be linked to data of the children's school situation and school achievement. This would lead to important improvement in the possibility to develop a more in-depth analysis of the drivers of inequality in school

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<sup>160</sup> Heller-Sahlgren, G. (2019). *Summary. Educational policy for health equality: Lessons for the Nordic region*. Stockholm: Nordic Welfare Centre, p. 9. [https://nordicwelfare.org/wp-content/uploads/2019/04/Education-Policy\\_HS\\_Webb\\_FINAL.pdf](https://nordicwelfare.org/wp-content/uploads/2019/04/Education-Policy_HS_Webb_FINAL.pdf)

<sup>161</sup> Arnesen, A., Braeken, J., Ogden, T., & Melby-Lervåg, M. (2019) Assessing children's social functioning and reading proficiency: A systematic review of the quality of educational assessment instruments used in Norwegian elementary schools. *Scandinavian Journal of Educational Research*, 63(3), 465–490. <https://doi.org/10.1080/00313831.2017.1420685>

achievement and educational trajectories. Such a research initiative has recently started in Norway.<sup>162</sup>

- There are also databases on school children, but these lack data on health and other important mediating and moderating factors. The extension of these databases would increase the possibility for research, development, and evaluation of educational practices and policies.
- Ethical concerns: The ethical issues related to a more in-depth research in this field have been well addressed by the ethical code for research and monitoring of sensitive issues such as health.
- Political concerns: The political aspects are important to recognise, as selective vested interests may make it impossible to use available resources.

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<sup>162</sup> Norwegian Institute of Public Health. (2019). *Health gap: Helse, modning og kjønnsforskjeller i skoleprestasjoner – prosjektbeskrivelse* [Health gaps: Health, development and gender differences in school achievement – project plan]. <https://www.fhi.no/cristin-prosjekter/aktiv/health-gap-helse-modning-og-kjonnsforskjeller-i-skoleprestasjoner/>

## 2. Gender-related inequalities in school achievement

Question: Are there differences in school achievement between boys and girls? A simple answer to this question is yes.

Table 6 shows gender differences in the PISA 2018 study in the Nordic countries as well as the OECD averages. The girls had higher mean score points in reading, mathematics, and science in the Nordic countries than in the OECD. In mathematics, boys had higher score points than girls in the OECD, but in the Nordic countries girls had higher, or the same, score points as boys. Denmark had the smallest differences between boys and girls.

Table 6: Equity related to gender (PISA 2018)

	Dk	Fi	Ice	No	Se	OECD
Reading: Girls outperformed boys	29 score points	52	41	47	34	30 score points
Mathematics: Boys outperformed girls	Girls scored like boys	Girls higher	Girls higher, 10	Girls higher, 7	Girls higher, 5	Boys higher 5
Science: Girls outperformed boys	Girls scored like boys	Girls higher 2	Girls higher, 8	Girls higher, 11	Girls higher, 2 score points	2 score points
Among high-performing: expected to work as an engineer at the age of 30	1 in 3 boys, 1 in 6 girls,	1 on 8 boys, 1 in 10 girls	1 in 5 boys, 1 in 7 girls	1 in 3 boys, 1 in 8 girls	3 in 8 boys, 1 in 5 girls	
Among high-performing: expected to work in health-related professions	1 in 9 boys, 3 in 10 girls	1 in 7 boys, 3 in 8 girls	1 in 10 boys, 1 in 3 girls	1 in 10 boys, 1 in 4 girls	1 in 10 boys, 1 in 5 girls	

A meta-analysis of studies with data from 1914 to 2011 in many countries concluded that girls get higher marks than boys.<sup>163</sup> Standardised tests of skills have stable gender differences between countries and over time: boys do better in mathematics and science while girls do better in reading. However, when analysing intelligence, there seem to be more boys than girls at the end of the distribution, that is, more boys than girls in the same age group score high and low.<sup>164</sup>

## On the political agenda

The Nordic cooperation in the area of gender equality is driven by the common vision of a gender-equal Nordic region with equal opportunities, rights, and obligations for all, irrespective of gender.<sup>165</sup> Gender is an essential research perspective for understanding development among children and youth<sup>166,167</sup> as well as human development in general<sup>168</sup> and research.<sup>169</sup>

A governmental committee in Sweden has explored gender and school achievement.<sup>170</sup> It may seem strange that there are still socioeconomic and gender differences in school achievement in Sweden given that Sweden has high gender and income equality.<sup>171</sup>

Also, a recent Norwegian governmental committee did an in-depth analysis of the gender difference in school achievement and educational trajectories.<sup>172</sup> Gender differences are a challenge for the society, and gender differences among school-age children are related, for example, to the educational status of their parents, immigration status of the family, and prevalence of teacher–pupil problems (more prevalence among boys). There is a consistent pattern of worse educational trajectories for Norwegian boys as indicated by marks and lower attainment in upper secondary schools

<sup>163</sup> Voyer, D., & Voyer, S. D. (2014). Gender differences in scholastic achievement: A meta-analysis. *Psychological Bulletin*, 140(4), 1174.

<sup>164</sup> Johnson, W., Carothers, A., & Deary, I. J. (2008). Sex differences in variability in general intelligence: A new look at the old question. *Perspectives on Psychological Science*, 3(6), 518–531.

<sup>165</sup> The Swedish Presidency of the Nordic Council of Ministers. (2018). *Programme on gender equality*. Copenhagen: Nordic Council of Ministers. <http://norden.diva-portal.org/smash/get/diva2:1190647/FULLTEXT01.pdf>

<sup>166</sup> Heilig, M. (2018). *Han, hon och hjärnan* [He, she, and the brain]. Stockholm: Natur och Kultur.

<sup>167</sup> Spear, L. (2010). *The behavioral neuroscience of adolescence*. New York: W. W. Norton.

<sup>168</sup> Bird, C. E., & Rieker, P. R. (2008). *Gender and health. The effect of constrained choices and social policies*. Cambridge: Cambridge University Press.

<sup>169</sup> See for instance FAS. (2011). *From women's health to gender medicine. An anthology*. Stockholm: The Swedish Council for Working Life and Social Research (FAS).

<sup>170</sup> Wernersson, I. (2010). *Könsskillnader i skolprestationer – Idéer om orsaker* [Gender differences in school performance – ideas about causes]. Stockholm: Statens offentliga utredningar.

<sup>171</sup> Stenmark, H., Bergström, E., Hägglöf, B., Öhman, A., & Petersen, S. (2016). Mental problems and their socio-demographic determinants in young schoolchildren in Sweden, a country with high gender and income equality. *Scandinavian Journal of Public Health*, 44(1), 18–26.

<sup>172</sup> NOU 2019:3. *Nye sjanser – bedre læring. Kjønnsforskjeller i skoleprestasjoner og utdanningsløp* [New chances – improved learning. Gender differences in school achievement and educational trajectory]. Oslo: Departementenes sikkerhets- og serviceorganisasjon, Kunnskapsdepartementet.

and more special education (70% are boys). Gender differences are also seen in higher education, where more women than men study and drop out to a lower degree.

Education attainment is related to life expectancy in that those with higher education can be expected to live longer. Education can also lead to health assets such as a healthy lifestyle, and higher income and social status, which also influence health outcomes and mortality.<sup>173</sup> A Swedish study found that extending the occupational school from two to three years and including some more theoretical contents reduced the probability of being convicted for a criminal offence, especially profit-driven crimes such as robbery, burglary, and theft.<sup>174</sup>

The Norwegian committee contracted a group of researchers for a systematic review of the causes of and measures against gender differences in school achievement.<sup>175</sup> This report is not a comprehensive systematic review, but it has a rapid-review format due to time and resource limitations. According to available evidence, boys are overrepresented in several negative statistics in education. They are, for example, overrepresented among pupils with reading and language difficulties and among pupils at risk for dropping out of school, which might have severe consequences for their choices later in life. There is evidence for relatively stable gender differences in school achievement in favour of girls over time, in contrast to the argument of increasing gender differences and a 'boy crisis' in education. The Norwegian report systematically summarises research (published between 2008 and 2018) addressing causal factors and effects of interventions on gender differences in school achievement. The review included three systematic reviews and 92 primary studies addressing individual, structural, and school-related factors (among these, 59 with a robust design, i.e., either longitudinal studies or studies with experimental design) and 30 intervention studies, of which 12 of high quality (validity).

Among causal factors on the individual level are cognitive skills (earlier cognitive maturation among girls from birth to 16 years of age), language skills (earlier among girls), and spatial skills (boys are

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<sup>173</sup> Hayward, M. D., Hummer, R. A., & Sasson, I. (2015). Trends and group differences in the association between educational attainment and U.S. adult mortality: Implications for understanding education's causal influence. *Social Science & Medicine* (1982), 127, 8–18.

<sup>174</sup> Åslund, O., Grönqvist, H., Hall, C., & Vlachos, J. (2017). Education and criminal behavior: Insights from an expansion of upper secondary school. *Labour Economics*, 52(C), 178–192.

<sup>175</sup> Wollscheid, S., Hjetland, H. N., Rogde, K., & Skjelbred, S.-E. (2018). *Årsaker til og tiltak mot kjønnsforskjeller i skoleprestasjoner: En kunnskapsoversikt* [Causes and interventions against gender differences in school achievement] (NIFU-rapport). Oslo: NIFU Nordisk institutt for studier av innovasjon, forskning og utdanning.

better than girls).<sup>177</sup> Personality and self-regulation, gender-specific expectancies and interests, physical activity, and mental health are also among factors influencing the gender differences in school achievement. Biological factors such as genetic brain differences, physical development, and puberty also play a role. However, differences in biological factors are small and the variation is large within each gender. The review noted that the evidence on whether gender differences in school achievement are related to intelligence or timing of puberty was scarce. One study in this review, however, shows that lower test scores among teenage boys can to a small degree be explained with later puberty and slower growth in cognitive skills. There was also some small evidence (few high-quality studies) on how differences in cognitive and non-cognitive skills can explain gender differences in school achievement.

The review also focused on structural factors in the society that influence the educational trajectory,<sup>177</sup> but only found 17 studies (13 with a robust design). Among factors on the family level were family income, the parents' educational level, parenting time and mother's employment, parental involvement in schooling, family structure including absence of fathers, siblings, parental health, neighbourhood, and growing-up environment. The evidence indicates that the socioeconomic status and a deficient family environment have a stronger impact on boys. However, differences noted between Norwegian and international studies seem to indicate that the welfare system in the country may affect how different family factors influence child development and school achievement. Labour market-related factors can also have an impact. The lack of longitudinal studies makes it difficult to explain the differences in educational outcomes between women and men.

For school-related factors, 21 studies (13 with a robust design) were included.<sup>177</sup> The evidence shows that girls were assessed more positively, especially when it comes to social and psychological factors. The evidence also showed that the teacher's gender had little importance for explaining gender differences in school achievement. Moreover, studies indicate that teachers meet boys with lower expectations, and that boys' behaviour was assessed more negatively compared to girls' behaviour. Some evidence indicated that boys might have a larger gain in being placed in groups with high-achieving pupils and a higher share of girls.

The comprehensive review also searched for causes in the preschool arrangement and in the primary school.<sup>177</sup>

Based on this review of the evidence, the committee suggested a series of measures, some of which are related to identified knowledge gaps. There is a need for a national registry that compiles individual process data from preschool and primary school. Research-based surveys of reading, mathematical skills, and the social development of all children should be carried out as well as national tests of reading, mathematics, and writing in specific age groups. The principle of early and adapted intervention is important in the schools, while the principle of a flexible age for starting school needs to be studied in more detail.

There is also a gender imbalance in higher education institutions. Therefore, NordForsk supports the Nordic Centre for Research on Gender Equality in Research and Innovation (NORDICORE)<sup>176</sup> at the Institute for Social Research in Norway,<sup>177</sup> which seeks to generate knowledge to further advance gender balance and diversity in research and innovation. The argument for the investment in NORDICORE is that the future of the Nordic knowledge economy depends on the ability to encourage the most highly qualified men and women to excel in research and research-based innovation. The project aims to accomplish five inter-related major objectives: (i) To assess the impact of equality policies already implemented in Nordic academic institutions; (ii) To identify barriers both internal to research organisations and external to them which impede gender equality and inclusion, and suggest ways to overcome these barriers; (iii) To understand challenges to gender equality in research and innovation within the larger labour market contexts in the Nordic countries; (iv) To bring words to action by engaging stakeholders at all stages of the research; and (v) To encourage knowledge exchange among national and international experts, researchers, students, policymakers, stakeholders, managers, equality workers, and other interested parties.

## School: a setting for both gender and human bodies

The school is one of the largest sectors of the labour market. The main conclusion in a research overview commissioned by the Swedish Work Environment Authority<sup>178</sup> is that organisational and

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<sup>176</sup> <https://www.nordforsk.org/en/programmes-and-projects/projects/nordic-centre-for-research-on-gender-equality-in-research-and-innovation-nordicore>

<sup>177</sup> <https://www.samfunnsforskning.no/core/nordicore/english/index.html>

<sup>178</sup> Sverke, M., Falkenberg, H., Kecklund, G., Magnusson Hanson, L., & Lindfors, P. (2016). *Kvinnors och mäns arbetsvillkor – betydelsen av organisatoriska faktorer och psykosocial arbetsmiljö för arbets- och hälsorelaterade utfall* [Working life for women and men – importance of organisational factors and psychosocial working environment for work-related and health-related outcomes]. Stockholm: Arbetsmiljöverket, Kunskapssammanställning 2016:2

10 psychosocial factors matter for work- and health-related outcomes. Too high demands and a lack of job resources are generally associated with lower job satisfaction, increased turnover intentions, as well as poorer mental and physical health. There is well-established evidence regarding which organisational and psychosocial factors contribute to positive work- and health-related outcomes. Furthermore, these findings underscore the importance of promoting a good work environment in general, for women as well as men, for different occupations, and for different sectors of the labour market.

In Sweden the only school subject where boys get better marks is physical education. The boys have more often externalising problems than girls, and boys often have difficulties to be calm and focused in the classroom. It may be important to notice that physical activity as well as rest have a bearing on school performance and achievement<sup>179</sup>.

The body is the most important instrument a person has. Although the development in 'spare-part medicine' has made great progress, a balanced body is important for human sustainability and well-being. Balance between work and rest is central. This can be achieved through physical activity, food, rest and sleep, or other health promotion methods.

The starting point is that health and learning have a mutual relationship. Although research on school performance and health is usually conducted entirely independently of one another, international research has long shown that there are links between the two.<sup>1</sup> Knowledge about health and learning is now a growing research field.<sup>15</sup> Another point of departure is that knowledge of the body and its functions can help to promote health and learning.<sup>180</sup> Health literacy has an important part that includes physical literacy. This is defined as a basic and valuable human ability that can be described as an acquired disposition including motivation, confidence, physical competence, knowledge, and understanding

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<sup>179</sup> The following part on physical activity is an abbreviated version of a book chapter written for an anthology. Eriksson, C. (2021). Fysisk aktivitet och skolprestationer – en forskningsgenomgång [Physical activity and school achievement – a research review] [The body and the head – keeping the body in balance and the pulse in learning]. In E. Hjörne & R. Säljö (Eds.), *Elevhälsa och hälsofrämjande skolutveckling i teori och praktik* [Student health and health-promoting school development in theory and practice]. (pp. 109-125). Malmö: Gleerups. [Health-promoting school development for a school for all].

<sup>180</sup> Kohl, H. W. III, & Cook, H. D. (Eds.). (2013). *Educating the student body: Talking physical activity and physical education to school*. Washington (DC): National Academic Press.

that create purposeful movements as an integral part of the lifestyle.<sup>181</sup>

### Physical activity, gender, and school achievement

Systemic thinking can help to paint a general picture of how different factors, such as goals and resources in school, can affect physical activity. The long-term goal of physical activity is to contribute to the school's health, development, and school performance. Foundations for a healthy life are laid. A more immediate result is that physical activity is carried out which can contribute to giving students competences and motivation for physical activity as well as social engagement through joint physical activity. It is important that students develop a physical literacy, which includes competence and motivation for physical activity. The social dimension is a major ingredient: joint physical activity adds value and contributes to the repetition and maintenance of activities.

Means to achieve this can be active transport to and from the school, teaching the school subject of sports and health, physical activity in the classroom, what happens during breaks, and physical activity and sports during school day and leisure, doable in many different ways.

Active transport to and from school: Most studies of active transport are about walking or cycling to and from school. Overview articles have summarised the state of knowledge.<sup>182,183</sup> These studies are typically small, but five studies covered large groups and showed good results.

Regular participation in physical activity is important for school performance: A review article based on 39 studies demonstrated the psychological and intellectual benefits of school-based physical activity programmes.<sup>184</sup> The greatest effects were seen in aerobic exercise such as jogging on site. Good effects were demonstrated by physical activities carried out in groups (10–30 students). Another review article focused on the relationship between physical activity and diets, and the cognitive development of young children (6

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<sup>181</sup> Whitehead, M. (2010). *Physical literacy: Throughout the lifecourse*. International Studies in Physical Education and Youth Sport. Abingdon, Oxon: Routledge.

<sup>182</sup> Chillón, P., Evenson, K. R., Vaughn, A., & Ward, D. S. (2011). A systematic review of interventions promoting active transportation to school. *Journal of Behavior, Nutrition and Physical Activity*, 8(10). <https://doi.org/10.1186/1479-5868-8-10>

<sup>183</sup> Villa-González, E., Barranco-Ruiz, Y., Evenson, K. R., & Chillón, P. (2018). Systematic review of interventions for promoting active school transport. *Preventive Medicine*, 111, 115–134.

<sup>184</sup> Fedewa, A.-L., & Ahn, S. (2011). The effects of physical activity and physical fitness on children's achievement and cognitive outcomes: A meta-analysis. *Research Quarterly of Exercise and Sport*, 82(3), 521–535.

months to 5 years).<sup>185</sup> The researchers found support for better cognitive development in children with both healthy physical activity and healthy foods. Basic motor development was positively related to children's cognitive development. Children are given the opportunity for physical activity through play, which is also important for their cognitive, social, and emotional development.<sup>186</sup> In a third review article, the researchers found that both regular physical exercise and more brief physical activity affect children's thinking, but that the link between changes in cognitive functions and school performance is a critical issue.<sup>187</sup>

Elements of physical activity can promote attention and memory functions: A literature review with careful quality control examined the value of classroom-based interventions with physically active learning methods in teaching for at least one week.<sup>188</sup> The studies had different outcome measures. The authors found six studies that demonstrated the means to large effect sizes for physical activity. Four studies showed effects on learning and three studies showed effects on body composition (BMI). Teachers and pupils were satisfied with the programmes, and the ability to concentrate improved. It is unclear whether a classroom-based physical activity affects students' overall physical activity level.<sup>189</sup>

Effects of physical activity on brain functions and school performance: Brain processes are necessary for learning, as they enable us to direct attention, switch between different tasks, and to store information in short-term memory and long-term memory. Brain research examines mechanisms for this and whether they can increase our understanding of the impact of physical activity on school performance. Here are some samples of what the research has shown.

Regular physical activity: Children aged 7–9 either had to be on a waiting list or participate in a FITKids programme, which consisted of 70 minutes of moderate to vigorous physical activity (MVPA) per

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<sup>185</sup> Tandon, P. S., Tovar, A. T., Welker, E., Schober, D. J., Copeland, K., Dev, D. A., Murriel, A. L., Amoso, D., & Ward, D. S. (2016). The relationship between physical activity and diet and young children's cognitive development: A systematic review. *Preventive Medicine Reports*, 2, 379–390.

<sup>186</sup> Tomporowski, P. D., McCullick, B., Pendleton, D. M., & Pesce, C. (2015). Exercise and children's cognition: The role of exercise characteristics and a place for metacognition. *Journal of Sport and Health Sciences*, 4, 47–55.

<sup>187</sup> Copeland, K. A., Sherman, S. N., Kendeigh, C. A., Kalkwarf, H. J., & Saelens, B. E. (2012). Societal values and policies may curtail preschool children's physical activity in child care centers. *Pediatrics*, 129(2), 265–274.

<sup>188</sup> Martin, R., & Murtagh, E. M. (2017). Effect of active lessons on physical activity, academic, and health outcomes: A systematic review. *Research Quarterly for Exercise and Sport*, 88(2), 149–168. <https://doi.org/10.1080/02701367.2017.1294244>

<sup>189</sup> McMichan, L., Gibson, A.-M., & Rowe, D. A. (2018). Classroom-based physical activity and sedentary behaviour interventions in adolescents: A systematic review and meta-analysis. *Journal of Physical Activity and Health*, 15, 383–393. <https://doi.org/10.1123/jpah.2017-0087>

weekday for nine months. After the programme, the children in the intervention group had a greater increase in aerobic fitness,<sup>190</sup> reduced adiposity,<sup>191</sup> and increased working memory (assessed by standardised memory test) than children on a waiting list.<sup>192</sup> Images of brain activity before and after the programme showed clear differences in activity to the benefit of the trained group.

This benefit of regular physical activity and fitness has emerged in many studies.<sup>192</sup> Physically trained children also have greater volume on the hippocampus and basal ganglia, suggesting that it is not only about increased blood supply in the brain but also about the growth of important brain structures.

Effect of breaks and outdoor activity: The need for breaks and recovery has long been a theme in working life research. In the world of school, breaks are a much-needed interruption from sedentary schoolwork, at least for all those who have 'running in their legs'. Since 2006, U.S. authorities have recommended that every child should have a 20-minute break each day, outdoors if possible and with a safe activity.<sup>193</sup>

In one study, it was found that children with at least 15 minutes of break had more appropriate behaviour in the classroom, i.e. could sit still and do school tasks.<sup>194</sup> Several surveys have also shown links between rest activities and cognitive ability, attitudes, and school behaviour.<sup>15,195</sup>

The time spent on physical activity, artistic activity, and music does not negatively affect students' other school performance, rather the opposite. Having breaks in school seems to increase concentration and problem-solving ability.<sup>196</sup> The significance of different types of rest activities remains to be explored.

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<sup>190</sup> Kamijo, K., Pontifex, M. B., O'Leary, K. C., Scudder, M. B., Wu, C. T., Castelli, D. M., & Hillman, C. (2011). The effect of afterschool physical activity program on working memory in preadolescent children. *Developmental Science*, 14(5), 1046–1058. <https://doi.org/10.1111/j.1467-7687.2011.01054.x>

<sup>191</sup> Khan, N., Raine, L., Drollette, E., Scudder, M., Pontifex, M. D., Castelli, D., Donovan, S., Evans, E., & Hillman, C. H. (2014). Impact of the FITKids physical activity intervention on adiposity in prepubertal children. *Pediatrics*, 133(4), e875–e883. <https://doi.org/10.1542/peds.2013-2246>

<sup>192</sup> Hillman, C. H., Erickson, K. I., & Kramer, A. F. (2008). Be smart, exercise your heart: Exercise effects on your brain and cognition. *Nature Review Neuroscience*, 9(1), 58–65.

<sup>193</sup> NASPE. (2006). *Recess for elementary school students (Statement paper)*. National Association for Sport and Physical Education. American Alliance for Health, Physical Education, Recreation and Dance. <http://elementaryhealthphysicalactivity.wiki.westga.edu/file/view/Recess-for-Elementary-School-Students-2006.pdf>

<sup>194</sup> Barros, R. M., Silver, E. J., & Stein, R. E. (2009). School recess and group classroom behavior. *Pediatrics*, 123(2), 431–436. <https://doi.org/10.1542/peds.2007-2825>

<sup>195</sup> Center for Disease Control and Prevention. (2010). *The association between school-based physical activity, including physical education, and academic performance*. Atlanta, GA: Department of Health and Human Services.

<sup>196</sup> Kohl, H. W. III, & Cook, H. D. (Eds.). (2013). *Educating the student body: Talking physical activity and physical education to school*. Washington, DC: National Academic Press.

Health through sports: Sports activities of various kinds can affect the practitioner, in this case children and young people, in a variety of ways.<sup>197</sup> For children to function effectively cognitively, development of good executive function (such as motivation, ability to set goals, and self-control) is also required, which can be stimulated by participation in sports. There are of course other activities, too, that affect cognitive functions such as playing a musical instrument or dancing.<sup>198,199,200</sup>

Health through dance and music: There should be a range of physical activities available to choose from. Dance is a social form of physical activity that is popular with young people. It emphasises the expressive, creative, aesthetic, emotional, and social aspects of physical activity. A dissertation project evaluated the health and cost-effectiveness of supplementing school health care with dance for girls aged 13 and 18 who experienced psychosomatic disorders, stress, and/or depression.<sup>201</sup> In the randomised study, the intervention group was allowed to dance for 75 minutes twice a week after school hours for eight months. The focus was not on performance, the goal was to dance just for the enjoyment of dance itself, not to achieve perfection or rehearse for a show. Dancing was appreciated by the participants; attendance was high and self-esteemed health was enhanced. The intervention was cost-effective through fewer visits to the school nurse and improved quality of life. Based on these studies, the following building blocks were recommended for a successful intervention: focus on joy of movement, co-determination and creativity, demand, strengthened contact with one's own body, and collaboration and social interaction.<sup>202</sup>

## Knowledge gaps and concerns

- In some schools in the Nordic countries gender pedagogy, gender-sensitive pedagogy, gender inclusion, and feminist pedagogy have been introduced as a measure of influencing

<sup>197</sup> Bidzan-Bluma, I., & Lipowska, M. (2018). Physical activity and cognitive functioning of children: A systematic review. *International Journal of Environmental Research and Public Health*, 15, 800. <https://doi.org/10.3390/ijerph15040800>

<sup>198</sup> Roden, I., Grube, D., Bongard, S., & Kreutz, G. (2014). Does music training enhance working memory performance? Findings from a quasi-experimental longitudinal study. *Psychology and Music*, 42, 284–298.

<sup>199</sup> Theorell, T. (2014). *Psychological health effects of musical health science. Theories, studies and reflections in music health science*. London: Springer.

<sup>200</sup> Theorell, T. (2016). Psychophysiological links between cultural activities and public health. In S. Clift & P. M. Camic (Eds.), *Oxford textbook of creative arts, health, and wellbeing. International perspectives on practice, policy, and research* (pp. 65–72). Oxford: Oxford University Press.

<sup>201</sup> Duberg, A. (2016). *Dance intervention for adolescent girls with internalizing problems. Effects and experiences*. Doctoral thesis, Örebro Studies in Medicine 141. Örebro: Örebro University.

<sup>202</sup> Duberg, A., Möller, M., & Taube, J. (2013). Dans kan ge skydd mot psykisk ohälsa [Dance can be protective against mental disorders]. *Läkartidningen*, 110, CDTT, 1–3.

the gender-related role in the school to improve the situation for the girls. A systematic review of gender innovations would be of interest. Moreover, the initiatives should be followed over years to analyse the impact on educational trajectories and selection of occupations.

- Educational practice should be researched to uncover the mechanism behind gender-based inequalities in school achievement. This would include longitudinal studies over many years. Having common theoretical and data collection approaches in the Nordic countries would facilitate such studies.
- Gender perspectives and gender theories should facilitate the analysis of educational practice and educational systems in the Nordic countries. This is on-going in the higher education and innovation sector and is included in the mandate for the Nordic centre of excellence, NORDICORE. Similar initiatives would be beneficial for the other educational levels.
- Early interventions among pre-schoolers and pupils in the first years in school should be tested in experimental studies where the children in a waiting-list school get the intervention later (depending on the outcome, one year or more later). Such studies should always be child-centred: the impact should always include systematic documentation of the effects on the school children. This is in line with the UN Convention on the Rights of the Child, which has been adopted by all Nordic countries. Moreover, the impact on the school systems and the working environment should be included in the comprehensive evaluation of the reforms or interventions.
- It would be beneficial to conduct experimental studies of different teaching methods as cluster-randomised studies comparing schools with different teaching methods. This initiative could also be important regarding gender differences in school achievement. If the results are positive, the control schools will receive the teaching innovation after an appropriate follow-up period. The use of field experiments in education has been discussed for many years.
- The school is a working environment for the children, teachers, and other school staff. Therefore, it would be important to close the knowledge gap on breaks, physical

activity, and length of lessons in relation to school achievement and health development among school-age girls and boys. This could be analysed in cluster-randomised studies or other controlled study designs. There are rules for adults but not for children, who are not considered as part of the labour force. This needs to be amended to adjust to the UN Convention on the Rights of the Child.

### 3. Socioeconomic inequalities in school achievement

Question: Are there differences in school achievement between children living in families with different socioeconomic status?

A first concern when studying the socioeconomic inequalities is which measure or measures of family background should be used. All three main indicators have disadvantages: parental education, parental occupation, and family income. It also matters which sources are available to provide the data. If the data comes from children, then reports on parental occupation and parental education can have a reasonable quality.<sup>203</sup> Research shows that children's reports of their father's occupation provided a reliable foundation on which to base comparisons across countries in socioeconomic gradients in reading test scores. The same was not true for children's reports of the number of books in the home – a measure of cultural capital often used in educational studies. However, relying on child self-reports may result in considerable missing data. Therefore, the addition of parental reports or linking to registry are beneficial.

Table 7 shows results from PISA 2018. The differences in PISA score are substantial between socioeconomically advantaged and disadvantaged students in the Nordic schools. There is also some variation between the Nordic countries. The shortage of staff and resources is more often reported in Sweden.

Table 7: Equity related to socioeconomic status (PISA 2018)

	Dk	Fi	Ice	No	Se	OECD
Difference in PISA score points between socioeconomically advantaged and disadvantaged students	78 score points	79	72	73	89	89 score points

<sup>203</sup> Jerrim, J., & Micklewright, M. (2014). Socio-economic gradients in children's cognitive skills: Are cross-country comparisons robust to who reports family background? *European Sociological Review*, 30(6), 766–781. <https://doi.org/10.1093/esr/jcu072>

Top performers in reading among advantaged students	16%	26%	12%	20%	25%	17%
among disadvantaged	3%	6%	3%	4%	5%	3%
Explained variance in mathematic performance by socioeconomic status	10%	12%	9%	8%	13%	14%
Top quarter of reading performance among disadvantaged students	12%	13%	13%	12%	11%	11%
Staff shortage and material shortage in disadvantaged schools according to principals	11%	4%	17%	17%	40%	34%
among advantaged schools	~ 0%	9%	1%	3%	18%	18%

Many studies show that educational performance is strongly associated with socioeconomic background.<sup>204, 205, 206, 207, 208</sup> A recent research anthology on socioeconomic inequality and student outcomes<sup>209</sup> compared the situation in different countries including Finland<sup>210</sup> and Sweden.<sup>211</sup>

To understand the impact of this relationship, it may be necessary to include the relationships between parental education, their offspring's education, and their offspring's later lifetime outcome. In an

<sup>204</sup> Breen, R., & Goldthorpe, J. H. (1997). Explaining educational differentials towards a formal rational action theory. *Rationality and Society*, 9(3), 275–305.

<sup>205</sup> Breen, R., & Jonsson, J. O. (2005). Inequality of opportunity in comparative perspective: Recent research on educational attainment and social mobility. *Annual Review of Sociology*, 31, 223–243.

<sup>206</sup> Breen, R., Luijkx, R., Müller, W., & Pollak, R. (2010). Long-term trends in educational inequality in Europe: Class inequalities and gender differences. *European Sociological Review*, 26(1), 31–48.

<sup>207</sup> Erikson, R., Goldthorpe, J. H., Jackson, M., Yaish, M., & Cox, D. R. (2005). On class differentials in educational attainment. *Proceedings of the National Academy of Sciences of the United States of America*, 102(27), 9730–9733.

<sup>208</sup> Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417–453.

<sup>209</sup> Volante, L., Schnepf, V., Jerrim, J., & Klinger, D. A. (Eds.). (2019). *Socioeconomic inequality and student outcomes. Cross-national trends, policies, and practices*. London: Springer.

<sup>210</sup> Salmela-Aro, K., & Chmielewski, A. K. (2019). Socioeconomic inequality and student outcomes in Finnish school. In L. Volante, V. Schnepf, J. Jerrim, & D. A. Klinger (Eds.), *Socioeconomic inequality and student outcomes. Cross-national trends, policies, and practices* (pp. 153–168). London: Springer.

<sup>211</sup> Löfstedt, P. (2019). Socioeconomic inequality and student outcomes. In L. Volante, V. Schnepf, J. Jerrim, & D. A. Klinger (Eds.), *Socioeconomic inequality and student outcomes. Cross-national trends, policies, and practices* (pp. 133–152). London: Springer.

empirical study, this model<sup>212</sup> was tested and it was found that income inequality was associated with several key components of the intergenerational transmission process—including access to higher education, financial returns on education, and the residual effect of parental education upon labour-market earnings. Moreover, consistent with the theoretical models, educational attainment was an important driver of the relationship between intergenerational mobility and income inequality. It was concluded that unequal access to financial resources plays a central role in the intergenerational transmission of advantage. More details are given in the original publication.<sup>215</sup>

A systematic review of international comparative studies of the determinants of socioeconomic inequality in student performance found 814 references, of which 35 studies met the eligibility criteria.<sup>213</sup> After reviewing studies on topics such as learning environment inside and outside the school, educational expenditure, teacher education, autonomy, accountability, differentiation, and competition from private schools, the researchers tentatively argued that the opportunity of choice reinforces inequality. However, most studies were descriptive in nature and their findings ambiguous at times. The review concludes that socioeconomic inequality is higher in countries where preschool is voluntary rather than compulsory, different tracks exist, the share of public funding is low, and private schools charge fees. Furthermore, there was little evidence on how to arrange the school learning environment to reduce social inequality.

A recent Swedish study found that both income and educational levels of mothers seemed to be more important for school achievement than those of the fathers.<sup>214</sup> However, unemployment among fathers seemed to have a stronger impact on risks of failure to graduate. A strong effect of poor mental health (measured by prescription of psychoactive drugs, ATC codes N05 and N06) was seen on both girls' and boys' school performance. Moreover, high family socioeconomic resources had a substantial mitigating effect for girls but much weaker effect for boys and only with regard to

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<sup>212</sup> Jerrim, J., & MacMillan, L. (2015). Income inequality, intergenerational mobility, and the Great Gatsby Curve: Is education the key. *Social Forces*, 94(2), 505–553.  
[https://johnjerrim.files.wordpress.com/2015/02/jerrim\\_macmillan\\_2015.pdf](https://johnjerrim.files.wordpress.com/2015/02/jerrim_macmillan_2015.pdf)

<sup>213</sup> Strietholt, R., Gustafsson, J. E., Högrefe, N., Rolfe, V., Rosén, M., Steinmann, E., & Hansen, K. Y. (2019). The impact of educational policies on socioeconomic inequality in student achievement: A review of comparative studies. In L. Volante, V. Schnepf, J. Jerrim, & D. A. Klinger (Eds.), *Socioeconomic inequality and student outcomes. Cross-national trends, policies, and practices* (pp. 17–38). London: Springer.

<sup>214</sup> Brännlund, A., & Edlund, J. (2019). Educational achievement and poor mental health in Sweden: The role of family socioeconomic resources. *Education Inquiry*, 11(1), 69–87.  
<https://doi.org/10.1080/20004508.2019.1687079>

secondary school graduation but not GPA (grade point average). Why is that? The analysis is a good example of a registry-based study. It was conducted on children born in Sweden in 1990 who continued to live in the country up to 2010 (115,882 in total).

## Segregation

A second concern is the pattern of segregation, which is a structural factor of importance also for school achievement. One study found that increased segregation with respect to student composition and academic outcomes across different schools was the main source of the declining educational equity in Sweden between 1998 and 2014.<sup>215</sup> The Swedish Government has mandated the Swedish Research Council to carry out a mapping of research into segregation.<sup>216</sup> The review covered the following areas: housing segregation, criminality, unemployment, schooling, and democracy/civil society with a focus on socioeconomic segregation. Studies of health were included if they also dealt with one of the five areas included in the mandate. Two main research themes emerged from the survey. One group of researchers primarily focused on the mechanisms that lead to segregation, while another group examined its consequences. The latter focus relates primarily to outcomes at the individual level, where the most common are the consequences of segregation on school results and educational level. Subject areas include research into the consequences of school segregation due to free choice of schools and market-driven schools and, ultimately, the consequences for pupils' school results. It was noted that the role of schools in societal segregation is a growing research field. Swedish segregation research compares well in an international perspective, thanks to, for example, the longitudinal register data at individual level produced by Statistics Sweden.

The report identified three knowledge gaps: the causal question, geographic focus, and specific shortcomings in the five different fields of the mapping exercise. According to the survey,<sup>218</sup> there are knowledge gaps regarding how the choice of preschool depends on household segregation and more generally how school choice on all levels varies by gender. Moreover, the question of how municipalities can mitigate school segregation and negative effects of school choice has been given too limited attention by policymakers and researchers. The long-term impact of the

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<sup>215</sup> Hansen, K. Y., & Gustafsson, J.-E. (2019). Identifying the key source of deteriorating educational equity in Sweden between 1998 and 2014. *International Journal of Educational Research*, 93, 79–90.

<sup>216</sup> VR. (2018). *Svensk forskning om segregation – En kartläggning av Vetenskapsrådet* [Swedish research on segregation – A survey by the Swedish Research Council]. [https://www.vr.se/download/18.4dd26b09169cbe0ddda629/1555326345256/Svensk-forskning-om-segregation\\_VR\\_2018.pdf](https://www.vr.se/download/18.4dd26b09169cbe0ddda629/1555326345256/Svensk-forskning-om-segregation_VR_2018.pdf)

opportunity of school choice needs to be further investigated and can be achieved by registry-based educational research.

The Swedish Education Act stipulates that preschool is equivalent when all children are offered a preschool experience of high quality. The Swedish Research Council<sup>217</sup> has noted that the concept of equivalence does not mean 'the same preschool for all'; instead it should be based on an analysis of how children from different backgrounds can achieve their potential in the preschool.

The report included 58 Swedish, Scandinavian, and international studies from the ERIC, ERC, and NB-ECEC databases. The studies were categorised by content into four main areas, and indicators of equivalence were designed and reported in matrices. The importance of preschool for children's learning and development in the short and long term has been verified in several studies. It has been particularly emphasised in international research that preschool of high quality is especially important for children in deprived living areas, for vulnerable children, and children from minority groups. The conditions surrounding the pedagogical relationships may support or hinder a high quality of the pedagogical relations. The presentation of the conditions has been structured in three main areas for preschool equivalency: 1. Preschool staff education and competence; 2. Preschool staff working conditions – staff–child ratio, group sizes, salary, planning time and space; and 3. Access to preschool. Preschools have a greater opportunity to promote social equality for all children if they are set out in the wider social and societal context.

## Migration background

Question: Are there differences in school achievement between children living in families with and without migration background?

Table 8 provides data from PISA 2018 on equity related to immigrant background. Yes, there are inequalities here. Sweden had the highest prevalence of children with immigrant background, followed by Norway and Denmark. These figures are an underestimation, as newly arrived immigrants are excluded from the PISA study. The prevalence of immigrant background among socioeconomically disadvantaged students was much higher in all Nordic countries. Moreover, the difference in reading performance between non-immigrant and immigrant students was large in all countries and

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<sup>217</sup> VR. (2015). *En likvärdig förskola för alla barn – Innebörder och indikatorer* [An equal pre-school for all – Meanings and indicators]. Stockholm: Swedish Research Council.  
[https://www.vr.se/download/18.2412c5311624176023d25a76/1555422970243/En-likvaerdig-foerskola\\_VR\\_2015.pdf](https://www.vr.se/download/18.2412c5311624176023d25a76/1555422970243/En-likvaerdig-foerskola_VR_2015.pdf)

remained so after adjustment for socioeconomic profile. Also, a lower proportion with immigrant background were found in the top quarter of reading performance in all Nordic countries compared to the OECD average.

Table 8: Equity related to immigrant background, PISA 2018 (2014)

	Dk	Fi	Ice	No	Se	OECD
Immigrant background	11% (9)	6% (3)	6% (2)	12% (7)	20% (12)	
Socioeconomically disadvantaged among immigrant students	4 in 7	4 in 9	3 in 7	1 in 2	1 in 2	
Difference in reading performance between non-immigrant and immigrant students	65 score points	92 score points	74 score points	52 score points	83 score points	
Adjusted for socioeconomic profile	34	74	55	33	54	
Top quarter of reading performance	9%	8%	7%	14%	10%	17%

## What can we do?

More than 100 researchers specialised in educational sciences, representing 8 countries at 14 universities, have spent years examining social justice in education from a range of angles.<sup>218</sup> These researchers are participants in the cross-national research programme Education for Tomorrow, which is funded by NordForsk. Based on a synthesis of this research, a group of researchers, members of the Nordic Centre of Excellence 'Justice Through Education' (JustEd), are now appealing to policymakers in the Nordic countries to adjust educational policies and curricula in a more equal and equitable direction. This includes offering three specific guidelines that explicitly address and promote: (1) Create equal access to schools and education. This requires prevention and counteracting market-based and privatisation policy reforms which contradicts fair and equal education; (2) Counteract discrimination

<sup>218</sup> Järf, C. (2018). New guidelines for policymakers. How to promote equality and equity in Nordic education. *NordForsk Magazine*, 28–29.  
[https://www.nordforsk.org/en/publications/publications\\_container/nordforsk-magazine-2018/view](https://www.nordforsk.org/en/publications/publications_container/nordforsk-magazine-2018/view)

and marginalisation in curricula and teacher education, explicitly address discrimination and marginalisation based on social class, gender, sexuality, ethnicity, disability, locality, and language; and (3) Balance content coverage, student initiative, and active participation. Balance student autonomy and active participation with cognitively demanding learning environments and use of digital technologies in the classroom.

Professor and JustEd Director Gunilla Holm, University of Helsinki, summarised the situation as follows:<sup>219</sup> 'Our research shows that marginalisation, discrimination and exclusion are surprisingly common in Nordic schools. To make a change we need to address the issues on both a political and a practical level. Exclusion and marginalisation of students are often based on differences related to social class, gender, sexuality, ethnicity, disability, locality, and language. Additionally, market-based and privatisation reforms in the Nordic countries have detrimental consequences for educational justice.'

## Knowledge gaps and concerns

- The infrastructure for research on socioeconomic inequalities in school achievement is comparatively well advanced in the Nordic countries.<sup>219</sup> It could be used more extensively in research in this field.
- Invest in the development of a Nordic database including individual statistics on school performance, educational trajectories, and lifelong achievement.
- Measures taken to lessen the socioeconomic inequalities in school achievement should be evaluated using the best available research designs.
- Add, if necessary, more evaluation dimensions in the proposed guidelines given by the JustEd researchers. Use a comprehensive approach where also a child-centred assessment includes impact on health and well-being.

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<sup>219</sup> <https://www.nordicstatistics.org/#>

## 4. Health development and school achievement

Equality in health is an important tenet of the welfare states in the Nordic region. It is therefore essential to consider the importance of the health of school-age children in relation to school achievement.

Question: Is there a relationship between physical and mental health and school achievement?

There are many different questions that can be phrased including different aspects of physical and mental health indicators such as the following: Is there a relationship between the prevalence of neuropsychiatric problems and school achievement? Such relationships are possible to study by cross-sectional designs. However, an important consideration is the direction of the relationship, and to estimate this would require longitudinal designs.

The level of education and years of schooling are associated with virtually all health outcomes: the higher the educational attainment, the better the health.<sup>220,221,222</sup> Two main explanatory pathways for these relationships have been presented: the social causation hypothesis and the hypothesis of health selection that can differ in importance at different periods of life course<sup>223,224,225</sup>. Studies from different countries have shown that health factors such as self-rated health, psychosomatic symptoms, and long-term illness in

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<sup>220</sup> Kröger, H., Pakpahan, E., & Hoffmann, R. (2015). What causes health inequality? A systematic review on the relative importance of social causation and health selection. *European Journal of Public Health*, 25(6), 951–60. <https://doi.org/10.1093/eurpub/ckv1114>

<sup>221</sup> Moor, I., Spallek, J., & Richter, M. (2017). Explaining socioeconomic inequalities in self-rated health: A systematic review of the relative contribution of material, psychosocial and behavioural factors. *Journal of Epidemiology and Community Health*, 71(6), 565–75. <https://doi.org/10.1136/jech-2016-207589>

<sup>222</sup> Conti, G., Heckman, J., & Urzua, S. (2010). The education–health gradient. *American Economic Review*, 100(2), 234–238. <https://doi.org/10.1257/aer.100.2.234>

<sup>223</sup> Hoffmann, R., Kröger, H., & Pakpahan, E. (2018). Pathways between socioeconomic status and health: Does health selection or social causation dominate in Europe? *Advances in Life Course Research*, 36, 23–36. <https://doi.org/10.1016/j.alcr.2018.02.002>

<sup>224</sup> Lynch, J. L., & von Hippel, P. T. (2016). An education gradient in health, a health gradient in education, or a confounded gradient in both? *Social Science and Medicine*, 154, 18–27. <https://doi.org/10.1016/j.socscimed.2016.02.029>

<sup>225</sup> West, P. (1991). Rethinking the health selection explanation for health inequalities. *Social Science and Medicine*, 32(4), 373–384. [https://doi.org/10.1016/0277-9536\(91\)90338-D](https://doi.org/10.1016/0277-9536(91)90338-D)

adolescence predict later educational outcomes,<sup>226,227,228,229</sup> while other studies have not supported the health selection hypothesis. For instance, one Swedish study did not find an association between depressive symptoms in adolescence and life-course trajectories of education and work.<sup>230</sup> Depression was in another study related to higher long-term educational attainment<sup>231</sup>.

Moreover, academic performance was followed in a longitudinal study of 26,766 Swedish women and men from the last year of compulsory school, at age 16, up to 48 years of age. During follow-up<sup>232</sup> 7.0% of the women and 4.4 % of the men were diagnosed with depression. After controlling for potential confounders (including childhood socioeconomic position and IQ), the increased risk for depression was found for the lowest quartile of grade point average (GPA, standardised by gender) for both women (1.7, 1.13–2.1) and men (2.9, 2.2–3.9). Also, additional control for externalising disorders attenuated the association especially in women. In other words, the association between poor academic performance and depression in young adulthood is partly explained by externalising disorders.

In a population-based cohort study using a different indicator based on individual-level microdata from Swedish national registers (hospitalisation data from the Swedish National Patient Register, a cohort of children born in 1990, n=115,196), it was found that girls with health problems that necessitated hospitalisation had poorer school achievement than boys who were hospitalised, especially among 13–16-year-olds.<sup>233</sup> Using retrospective observational data

<sup>226</sup> Lynch, J. L., & von Hippel, P. T. (2016). An education gradient in health, a health gradient in education, or a confounded gradient in both? *Social Science and Medicine*, 154, 18–27. <https://doi.org/10.1016/j.socscimed.2016.02.029>

<sup>227</sup> Koivusilta, L., Rimpelä, A., & Rimpelä, M. (1995). Health status: Does it predict choice in further education? *Journal of Epidemiology and Community Health*, 49(2), 131–138. <https://doi.org/10.1136/jech.49.2.131>

<sup>228</sup> Acacio-Claro, P., Doku, D., Koivusilta, L., & Rimpelä, A. (2018). How socioeconomic circumstances, school achievement and reserve capacity in adolescence predict adult education level: A three-generation study in Finland. *International Journal of Adolescence and Youth*, 23(3), 382–397. <https://doi.org/10.1080/02673843.2017.1389759>

<sup>229</sup> Haas, S. A., & Fosse, N. E. (2013). Health and the educational attainment of adolescents: Evidence from the NLSY97. *Journal Health and Social Behavior*, 49(2), 178–192. <https://doi.org/10.1177/002214650804900205>

<sup>230</sup> Landstedt, E., Brydsten, A., Hammarström, A., Virtanen, P., & Almqvist, Y. B. (2016). The role of social position and depressive symptoms in adolescence for life-course trajectories of education and work: A cohort study. *BMC Public Health*, 16(1), 1–16. <https://doi.org/10.1186/s12889-016-3820-4>

<sup>231</sup> Jonsson, U., Bohman, H., Hjern, A., von Knorring, L., Olsson, G., & von Knorring, A.-L. (2010). Subsequent higher education after adolescent depression: A 15-year follow-up register study. *European Psychiatry*, 25(7), 396–401.

<sup>232</sup> Wallin, A. S., Koupli, I., Gustafsson, J.-E., Zammit, S., Allebeck, P., & Falkstedt, D. (2019). Academic performance, externalizing disorders and depression: 26,000 adolescents followed into adulthood. *Social Psychiatry and Psychiatric Epidemiology*, 54, 977–986. doi.org/10.1007/s00127-019-01668-z

<sup>233</sup> Bortes, C., Strandh, M., & Nilsson, K. (2018). Health problems during childhood and school achievement: Exploring associations between hospitalization exposures, gender, timing, and compulsory school grades. *PLoS One*, 13(12), e0208116.

from the same microdata sources, the researchers found in a subsequent study<sup>234</sup> that it was not the variability in drug treatment but the differences in diagnoses between boys and girls that explained this difference. Girls' hospitalisations were more commonly related to mental and behavioural diagnoses, which have particularly detrimental effects on school achievement.

An example of a methodologically interesting study is the Metropolitan Longitudinal Finland (MetLoFin) study<sup>235</sup> where data has been collected in classroom surveys for a cohort of students (n = 5,614) from the Helsinki Metropolitan Region followed from the 7th grade (12–13 years) up to the 9th grade (15–16 years) when the choice between the academic and the vocational track is made in Finland. Health factors (Strengths and Difficulties Questionnaire SDQ), self-rated health, daily health complaints, and long-term illness and medicine prescribed) and sociodemographic background were self-reported by the students while their educational aspirations (applying for academic versus vocational track, or both) and their academic achievement were registry data from the Finnish National Agency for Education. Using multilevel multinomial logistic regression, the researchers uncovered that all studied health factors were associated with adolescents' educational aspirations. Moreover, for the SDQ, daily health complaints, and self-rated health, these associations persisted after controlling for sociodemographic background and academic achievement. Students with better health in adolescence were more likely to apply for the academic track, and those who were less healthy were more likely to apply for the vocational track. The study also found robust associations between educational aspirations and worsening health from grade 7 to grade 9. This study thus supports the reciprocity between health and learning in line with the results from the systematic review referred to in the introduction.

Many studies in this field are cross-sectional analyses. More longitudinal studies are needed for more in-depth analysis of mechanisms and mediating and moderating factors. Important relationships and factors can be uncovered in both types of studies.

The relationship between school stress, school demand, and different health indicators among school-age children has been

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<sup>234</sup> Bortes, C., Strandh, M., & Nilsson, K. (2019). Is the effect of ill health on school achievement among Swedish adolescents gendered? *SSM – Population Health*, 8, 100408. <https://doi.org/10.1016/j.ssmph.2019.100408>

<sup>235</sup> Dobewall, H., Lindfors, P., Karvonen, S., Koivusilta, L., Vainikainen, M. P., Hotulainen, R., & Rimpelä, A. (2019). Health and educational aspirations in adolescence: A longitudinal study in Finland. *BMC Public Health*, 19, 1447. <https://doi.org/10.1186/s12889-019-7824-8>

studied in many types of cross-sectional studies.<sup>236, 237, 238, 239, 240, 241</sup> A cross-sectional study<sup>242</sup> found that higher demands were associated with greater perceived stress and an increased risk of recurrent pain, while greater coping resources at school were clearly associated with less perceived stress and a lower likelihood of recurrent pain. Moreover, it seems that coping resources may not buffer the effect of high demands on stress. Access to coping resources was of similar magnitude among boys and girls, but the protective effect of coping resources on perceived stress was more pronounced among boys than girls.

In a study based on two waves of longitudinal data at age 13 and age 16 in a nationally representative sample of about 9000 individuals from the Swedish longitudinal Evaluation Through Follow-up database<sup>243</sup> it was found that girls had a considerably higher self-reported level of mental health problems at the end of compulsory school than boys. This gender difference was entirely accounted for by perceived school demands in grades 6 and 9. Moreover, students who were stronger in inductive than vocabulary ability reported lower levels of perceived academic demand and less stress.

There have been many studies on bullying in schools using questionnaires. It is beyond the scope of the report to review these studies. However, bullying has also been analysed by both

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<sup>236</sup> Nygren, K., & Hagquist, C. (2017). Self-reported school demands and psychosomatic problems among adolescents – Changes in the association between 1988 and 2011? *Scandinavian Journal of Public Health*. <https://doi.org/10.1177/1403494817725687>

<sup>237</sup> Modin, B., Östberg, V., Toivanen, S., & Sundell, K. (2011). Psychosocial working conditions, school sense of coherence and subjective health complaints: A multilevel analysis of ninth grade pupils in the Stockholm Area. *Journal of Adolescence*, 34(1), 129–139. <https://doi.org/10.1016/j.adolescence.2010.01.004>

<sup>238</sup> Sonmark, K., & Modin, B. (2017). Psychosocial work environment in school and students' somatic health complaints: An analysis of buffering resources. *Scandinavian Journal of Public Health*. <https://doi.org/10.1177/1403494816677116>

<sup>239</sup> Plenty, S., Östberg, V., Almquist, Y. B., Augustine, L., & Modin, B. (2014). Psychosocial working conditions: An analysis of emotional symptoms and conduct problems amongst adolescent students. *Journal of Adolescence*, 37(4), 407–417. <https://doi.org/10.1016/j.adolescence.2014.03.008>

<sup>240</sup> Wiklund, M., Malmgren-Olsson, E.-B., Öhman, A., Bergström E., & Fjellman-Wiklund A. (2012). Subjective health complaints in older adolescents are related to perceived stress, anxiety and gender: A cross-sectional school study in Northern Sweden. *BMC Public Health*, 12, 993. <https://doi.org/10.1186/1471-2458-12-993>

<sup>241</sup> Ravens-Sieberer, U., Torsheim, T., Hetland, J., Vollebergh, W., Cavallo, F., Jericek, H., Alikasifoglu, M., Välimaa, R., Ottova, V., Erhart M., & Michael Erhart & the HBSC Positive Health Focus Group. (2009). Subjective health, symptom load and quality of life of children and adolescents in Europe. *International Journal of Public Health*, 54, 151–159. <https://doi.org/10.1007/s00038-009-5406-8>

<sup>242</sup> Östberg, V., Plenty, S., Låftman, S. B., Modin, B., & Lindfors, P. (2018). School demands and coping resources – Associations with multiple measures of stress in mid-adolescent girls and boys. *International Journal of Environmental Research and Public Health*, 15(10), 2143. <https://doi.org/10.3390/ijerph15102143>

<sup>243</sup> Giota, J., & Gustafsson, J. E. (2016). Perceived demands of schooling, stress and mental health: Changes from grade 6 to grade 9 as a function of gender and cognitive ability. *Stress and Health*. <https://doi.org/10.1002/smi.2693>

questionnaire data and the collection of cortisol,<sup>244</sup> that is, integrated stress research in research on bullying.

Repeated cross-sectional data collection has a strength in analysing time trends. The availability of this data is an important infrastructure for such research. The international study Health Behaviour of School-aged Children (HBSC) can be used for comparative Nordic studies. In addition, there are national repeated cross-sectional studies of children and adults as part of the monitoring of public health at national and regional levels. An important development within public health research is the life course research. It has resulted in large cohorts that are followed from birth onward. Such studies are on-going in many countries, including Denmark, Norway, and Sweden.

## Development of adolescent mental health in the Nordic countries

The HBSC data collected between 2002 and 2014 across the five Nordic countries has been used in examining different trends, which are presented in detail in the articles in a special issue of the *Nordic Welfare Research*.<sup>245</sup> The HBSC study has given us the opportunity to study different measures of mental health or related measures over a period of 12 years. Outcomes studied include self-rated health, psychosomatic symptoms, life satisfaction, and sleep. The approach has been to analyse excellent self-rated health, high life satisfaction, and lack of psychosomatic symptoms and sleep, thus focusing on the positive aspects of mental health. The question is if such approaches can be considered proxy measures of positive mental health. Furthermore, the development of two main factors associated with adolescents' mental health is also investigated in this study: (a) family communication and (b) schoolwork pressure.

The overall prevalence of adolescents with high life satisfaction has declined in most Nordic countries.<sup>246</sup> However, in 2002, Norway had the lowest prevalence of high life satisfaction, but in the 12 years that followed Norway was the only Nordic country to show a positive development with an almost 10-percentage-point increase in the prevalence of high life satisfaction. Thus, in 2014, more than 40% of

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<sup>244</sup> Östberg, V., Låftman, S. B., Modin, B., & Lindfors P. (2018). Bullying as a stressor in mid-adolescent girls and boys – Associations with perceived stress, recurrent pain, and salivary cortisol. *International Journal of Environmental Research and Public Health*, 15, 364. <https://doi.org/10.3390/ijerph15020364>

<sup>245</sup> Eriksson, C., Arnarsson, A. M., Damsgaard, M. T., Potrebny, T., Suominen, S., Thorsteinsson E. B., Torsheim, T., & Due, P. (2019). Building knowledge of adolescent mental health in the Nordic countries: An introduction to a Nordic research collaboration. *Nordic Welfare Journal*, 4(2), 43–54.

<sup>246</sup> Due, P., Eriksson, C., Torsheim, T., Potrebny, T., Välimaa, R., Suominen, S., Rasmussen, M., Currie, C., & Damsgaard, M. T. (2019). Trend in high life satisfaction among adolescents in five Nordic countries 2002–2014. *Nordic Welfare Research*, 4(2), 67–76.

Norwegian adolescents had high life satisfaction, the highest level of all the Nordic countries included in the study.

The trend of excellent self-rated health for Nordic adolescents indicates a small overall improvement between 2002 and 2006, but a stable trend in the following periods until 2014.<sup>247</sup> Two of the countries (Denmark and Iceland) show a relatively stable pattern over the 12-year period, while Finland and especially Sweden show a decline in the prevalence of students with excellent self-rated health. The only country to show a positive development in the prevalence of students with excellent self-rated health from 2002 to 2014 is Norway.

The prevalence of two or more weekly health complaints showed large differences by country over time and especially in 2014, when Iceland and Sweden had an almost 10-percentage-point larger prevalence of multiple weekly symptoms (about 35%) than Denmark, Finland, and Norway (about 25%). The trend over time showed rising prevalence levels in Iceland and Denmark, a relatively stable level over time in Finland, and large changes in Sweden over time with lowest levels in 2006 and 2010. The only country to show a decline by the end of the 12-year period was Norway.

The prevalence of sleep difficulties has increased over the 12-year period in Denmark, Iceland, and Finland.<sup>248</sup> In Sweden the prevalence fell from 26% to 21% from 2002 to 2006 but rose by 10 percentage points from 2010 (21%) to 2014 (31%). The only country with a positive development over the 12-year period was Norway; after an increase in the prevalence of sleeping difficulties from 2002 to 2010, the prevalence declined in 2014 to 17%, the lowest prevalence of sleep difficulties in any of the five Nordic countries.

The prevalence of adolescents finding it easy to talk to their mother or father or both has showed a positive development in all countries from 2002 to 2014.<sup>249</sup> The development has been especially positive in the prevalence of communication with fathers, which has improved by around 10% in Denmark, Iceland, Finland, and Norway. The three latter countries have thus caught up with the high prevalence of positive communication with fathers in Sweden. In

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<sup>247</sup> Potrebny, T., Torsheim, T., Due, P., Välimaa, R., Suominen, S., & Eriksson, C. (2019). Trends in excellent self-rated health among adolescents: A comparative Nordic study. *Nordic Welfare Research*, 4(2), 54–66.

<sup>248</sup> Thorsteinsson, E. B., Potrebny, T., Arnarsson, A., Tynjälä, J., Välimaa, R., & Eriksson, C. (2019). Trends in sleeping difficulty among adolescents in five Nordic countries 2002–2014. *Nordic Welfare Research*, 4(2), 77–87.

<sup>249</sup> Arnarsson, A., Potrebny, T., Torsheim, T., & Eriksson, C. (2019). Trends in Nordic adolescents' communication with their parents. *Nordic Welfare Research*, 4(2), 88–100.

Denmark, the prevalence of easy communication with fathers is still the lowest (65%).

In the period from 2002 to 2014, the level of school pressure was highest in Iceland and Finland.<sup>250</sup> In Denmark, Iceland, and Finland, there was an increase in perceived school pressure over the period, whereas prevalence levels decreased in Sweden. In Norway, the prevalence level of feeling pressured by schoolwork was stable from 2002 to 2014. The older adolescents (15-year-olds) felt more pressure, and over the 12-year period gender differences increased, so that more girls than boys felt pressured by schoolwork in 2014. In 2002 the prevalence levels of school pressure were similar among boys and girls.

In addition to analysing trends in mental health and related factors, new data on positive mental health has been collected in the latest HBSC data collection.<sup>251</sup> This Nordic research collaboration has employed the available infrastructure for developing new research opportunities while making good use of what is offered by wider international research collaboration.

The HBSC study is used because it gives the researcher an excellent starting point thanks to several assets: (i) Quality: The HBSC study provides opportunities for high-quality research and monitoring of the health of school-age children; (ii) Coverage: The HBSC study has collected data about health, well-being, health behaviours, and social environments over a 30-year period (1984–2018) in the Nordic countries; (iii) Comprehensiveness: The HBSC study also highlights a range of protective and risk factors associated with social environments that can create opportunities to improve young people's health; (iv) Relevant collection of data: The HBSC study includes data on core measurement instruments relevant to the study of adolescent health; and (vi) Appropriate analytic methodologies: Central to the HBSC study is a standardised protocol ensuring data are collected using a prescribed methodology, which allows comparison of data across countries and over time.

It would be beneficial if such Nordic research based on on-going surveys and production of statistics and registry data could be facilitated by collaboration grants. These grants would enhance Nordic research in the field of school achievement, social inequality,

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<sup>250</sup> Löfstedt, P., Eriksson, A., Potrebny, T., Välimaa, R., Thorsteinsson, E. B., Due, P., Damsgaard, M. T., Rasmussen, M., Suominen, S., & Torsheim, T. (2019). Trends in perceived school stress among adolescents in five Nordic countries 2002–2014. *Nordic Welfare Research*, 4(2), 101–112.

<sup>251</sup> Eriksson, C., Arnarsson, A. M., Damsgaard, M. T., Hagquist, C., Löfstedt, P., Potrebny, T., Suominen, S., Thorsteinsson, E. B., Torsheim, T., Välimaa, R., & Due, P. (2019b). Towards enhancing positive mental health research. *Nordic Welfare Research*, 4(2), 113–128.

and health development among school-age children in the Nordic countries.

## Increased mental health problems and decreasing school achievement among adolescents: a Nordic challenge

We are in the midst of major societal changes that have an impact on the situation and future of children and especially young people.<sup>252</sup> Adolescence is a stage that brings many changes in different spheres of life – physical, sexual, cognitive, identity, and in terms of relationships with parents, siblings, and peers.<sup>253</sup> Adolescence is also a period in which a person's health and health behaviour can have serious consequences for health later in life. At the individual level, the health of young people is strongly influenced by social factors at the personal, family, neighbourhood, and national levels. At a global level, the strongest determinants of young people's health are structural factors such as national wealth, income inequality, and access to education.<sup>254</sup>

Although most young people enjoy good mental health, physical, emotional, and social changes, including exposure to poverty, exploitation, or violence can make them vulnerable to various forms of mental health problems.<sup>255</sup> Young people face many challenges such as increasing academic expectations, changes in social relationships with family and peers, and physical and emotional changes associated with increasing maturity. They become increasingly independent and make decisions that shape their health, behaviour, education, and future socioeconomic opportunities. Youth is also a time of experimenting with such phenomena as being out of direct parental control, trying alcohol and drugs, staying away from home, and having the first sexual experiences.<sup>256</sup> In the process of increasing independence, habits develop which can have long-term significance for health and well-being.

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<sup>252</sup> Seiffge-Krenke, I. (2017). Does adolescents' psychopathology change in times of change? *Journal of Adolescence*, 61, 107–112.

<sup>253</sup> Shulman, S., & Scharf, M. (2018). Adolescent psychopathology in times of change: The need for integrating a developmental psychopathology perspective. *Journal of Adolescence*, 65, 95–100.

<sup>254</sup> Viener, R. M., Ozer, E. M., Marmot, M., Resnick, M., & Currie, C. (2012). Adolescent health 2. Adolescence and the social determinants of health. *The Lancet*, 379(April 28), 1641–1652.

<sup>255</sup> WHO. (2018). *Adolescents: Health risks and solutions*. <http://www.who.int/en/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions>

<sup>256</sup> Seiffge-Krenke, I. (2017). Does adolescents' psychopathology change in times of change? *Journal of Adolescence*, 61, 107–112.

Today's young people have grown up with the Internet and mobile phone,<sup>257</sup> which have affected their everyday lives in drastic ways, providing opportunities for positive experiences but also negative ones (cyberbullying). Has the mobile phone become the drug of today?<sup>258</sup> A high tempo, constant stress, and a digital lifestyle with unbroken connection are bound to have consequences for our brain and how we feel. We ought to limit the negative effects of the digital lifestyle. In his book *Skärmtid* (Screen time), the Swedish psychiatrist and author Anders Hansen gives plenty of advice, such as:<sup>259</sup> 'Identify your use of the mobile phone. Buy an alarm clock and a wristwatch. Turn off the cell phone for one or a few hours a day.' To children and young people, he says: 'No cell phone in the classroom. Set screen time limits and do other things. Lead by example.' The brain is malleable, and its reward system is triggered by social media.<sup>260</sup> Vigorous and repetitive activity in the reward area of the brain is associated with the risk of growing addicted to an activity, which is risky especially for boys. The brain needs stimulation-free recovery time, and screen usage needs to be limited.

Health-related behaviours and health problems that are established during this transition period can continue throughout adulthood, deepen and increase. These are issues of mental health, development of health problems, obesity, tobacco use, physical activity, and alcohol use. Although Nordic adolescents live in a welfare state, they experience different social conditions which change over time, for example through periods of economic crisis and economic globalisation.

Mental health problems increased among adolescents and young adults in Europe between 1950 and 1990 but decreased in all Nordic countries except Sweden between 1990 and 2010.<sup>261</sup> Suicide rates at ages 15–24 decreased in most Nordic countries between 1990 and 2010, except for Sweden again, where a small increase was noted.

Compared to other Nordic countries, self-reported psychosomatic problems are worse among adolescents in Sweden,<sup>262</sup> where the frequency has increased since the 1980s. The number of patients in Sweden admitted to hospital with a mental health diagnosis has

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<sup>257</sup> Twenge, J. M. (2018). *iGen. Smartphonegenerationen*. Stockholm: Natur & Kultur.

<sup>258</sup> Hansen, A. (2019). *Skärnhjärnan. Hur en hjärna i osynk med sin tid kan göra oss stressade och deprimerade* [Screen brain. How a brain in non-sync with its time can make us stressed and depressed]. Stockholm: Bonnier Fakta.

<sup>259</sup> Hansen, A. (2019). op.cit., pp. 187–188.

<sup>260</sup> Nutley, S. (2019). *Distraherad. Hjärnan, skärmen och krafterna bakom*. Stockholm: Natur & Kultur.

<sup>261</sup> Bremberg, S. (2015). Mental health problems are rising more in Swedish adolescents than in other Nordic countries and the Netherlands. *Acta Paediatrica*, 104, 997–1004.

<sup>262</sup> Hagquist, C. (2015). *Skolelevers psykiska hälsa*. Stockholm: Nordic Centre for Welfare and Social Issues.

more than doubled in the past 20 years, a pattern that applies to both boys and girls. The pattern in the four other Nordic countries is clearest for older adolescents, particularly girls. Self-reported psychosomatic problems have increased in Finland and Norway, while the figures for Denmark have remained stable. A more recent psychometric analysis using the HBSC data<sup>263</sup> confirmed the increasing rates of adolescent mental health problems in the Nordic countries. Moreover, Finland is joining Sweden in having the sharpest increase among older adolescents, especially among girls.

The Public Health Agency of Sweden has recently analysed potential factors causing the increase in multiple health disorders among children and adolescents in Sweden. The focus is on four main areas: factors within the family, socioeconomic conditions of the family, school and learning, and structural changes.<sup>264</sup> The overall conclusion is that the malfunctioning of the Swedish school system and greater demands in the labour market probably lie behind the increase in multiple health disorders among children and adolescents.

During the last years other explanations have been raised for the reported increase in mental health problems especially among girls. One line of argument takes its departure from a critique of what the question really means and that discomfort in daily life is mixed with more serious problems. This has been discussed in mass media both in Denmark <sup>265</sup> and Sweden.<sup>266, 267, 268</sup> The Swedish debate concerned three main issues. The measurement instrument is a self-report scale which does not consider the impact of these symptoms. The researchers have presented their findings in a popular science journal<sup>269</sup> before discussing them in a proper scientific publication. Another facet relates to the cultural climate, which may influence the tendency to report and perceive mental health problems. In a

<sup>263</sup> Hagquist, C., Due, P., Torsheim, T., & Välimaa, R. (2019). Cross-country comparison of trends in adolescent psychosomatic symptoms – A Rasch analysis of HBSC data from four Nordic countries. *Health and Quality of Life, 17*, 27. <https://doi.org/10.1186/s12955-019-1097-x>

<sup>264</sup> PHAS. (2018). *Varför har den psykiska ohälsan ökat bland barn och unga i Sverige? Utvecklingen under perioden 1985–2014* [Why have mental disorders increased among children and youth in Sweden? Development in 1985–2014]. Stockholm: Public Health Agency of Sweden. [www.folkhalsomyndigheten.se/publicerat-material](http://www.folkhalsomyndigheten.se/publicerat-material)

<sup>265</sup> Boas, A. (2019). Ondt i hverdagslivet [Pain in daily life]. *Weekendavisen*, 5 Juli 2019. <https://www.weekendavisen.dk/2019-27/ideer/ondt-i-hverdagslivet>

<sup>266</sup> Engström, I., Bremberg, S., & Wikman, S. (2019). Dåligt stöd för att psykiska sjukdomar ökar bland unga [Limited evidence for the increase in mental diseases among young people]. *Dagens Nyheter*, DN Debatt 22 May 2019.

<sup>267</sup> Wigsell, O., & Lindén, T. (2019). Orsaken till ökningen [The reason for the increase]. *Dagens Nyheter*. Replik DN Debatt 24 May 2019.

<sup>268</sup> Ejefalk, M. (2019). Forskare: Ungas vardagsproblem blandas ihop med psykisk ohälsa [Researcher: Young people's everyday problems are mixed up with mental illness]. *Dagens Nyheter*, 27 May 2019, 27–28.

<sup>269</sup> Kvist Lindholm, S., & Wickström, A. (2019). Nyansera förståelsen av ungas psykiska ohälsa [We need to understand young people's mental health in more balanced terms]. *Elevhälsan*, 1(7), 1–12.

qualitative study of adolescents in the UK, the researchers found that the increased anxiety among young people related to future orientation, social media use, education, austerity, and normalisation of mental distress and self-harm.<sup>270</sup> A second issue concerned the use of health care statistics as a measure of morbidity. The use of psychiatric treatment and prescription of psychoactive drugs among Swedish adolescents have also increased, but this does not necessarily reflect the true picture. A third issue is the on-going medicalisation of symptoms and complaints.

There are also great possibilities to build research on earlier longitudinal studies which can be repeated, and Nordic comparisons are possible as such studies are available in all Nordic countries. However, this requires collaborative research beyond disciplinary and national borders.

A constructive approach to these questions is reviewing the available evidence and doing research to fill the knowledge gaps. It is important to understand how young people think and perceive mental health,<sup>271</sup> which can be investigated by think-aloud methods.<sup>272</sup> Moreover, it may be important to have a gender perspective, as the differences between girls and boys are very large.<sup>273,274</sup> However, it is important to use the full potential of modern research approaches. A prerequisite for this is that quantitative and qualitative researchers interact and facilitate a synergetic transdisciplinary development. The challenge from the research questions which relate to school achievement, social inequality, and health development calls for peace in the so-called paradigm war: a mixed-methods approach is fruitful and beneficial.<sup>275,276</sup>

## What can we do?

Supporting school completion is a way of reducing health inequalities. Every year there are a lot of young people who have not

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<sup>270</sup> Bell, J., Reid, M., Dyson, J., Schlosser, A., & Alexander, T. (2019). There's just huge anxiety: Ontological security, moral panic, and the decline in young people's mental health and well-being in the UK. *Qualitative Research in Medicine & Healthcare*, 3, 87–97.

<sup>271</sup> Johansson, A., Brunnberg, E., & Eriksson, C. (2007). Adolescent girls' and boys' perceptions of mental health. *Journal of Youth Studies*, 10(2), 183–202.

<sup>272</sup> Joffer, J., Jerdén, L., Öhman, A., & Flacking, R. (2016). Exploring self-rated health among adolescents: A think-aloud study. *BMC Public Health*, 16(1), 1–10.

<sup>273</sup> Landstedt, E., Aspelund, K., & Gillander Gådin, K. (2009). Understanding adolescent mental health: The influence of social processes, doing gender and gendered power relations. *Sociology of Health & Illness*, 31(7), 962–978.

<sup>274</sup> MacLean, A., Sweeting, H., & Hunt, K. (2010). 'Rules' for boys, 'guidelines' for girls: Gender differences in symptom reporting during childhood and adolescence. *Social Science and Medicine*, 70, 597–604.

<sup>275</sup> Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Los Angeles: Sage.

<sup>276</sup> Lund, T. (2012). Combining qualitative and quantitative approaches: Some arguments for mixed methods research. *Scandinavian Journal of Educational Research*, 56(2), 155–165.

completed school.<sup>277</sup> In four Nordic countries (Denmark, Finland, Norway, and Sweden) the level of education has become increasingly important for individual employment. There are many ways to improve schooling outcomes. Hattie<sup>278,279</sup> reviewed 800 meta-analyses (90,000 studies) regarding 250 different factors related to student achievement. The visibility learning story has as a major message 'know thy impact'.<sup>280</sup> According to research, the following six things matter the most: (i) Achieving teacher collective efficacy; (ii) Knowing student prior learning; (iii) Emphasising success criteria; (iv) Using feedback, welcoming errors, and building trust; (v) Structuring for deep on-top-of-surface learning; and (vi) Holding high expectations and the right level of challenge. But there is also a list of four messages that have much less influence than we might intuitively think: (i) Teacher demographics; (ii) Student attributes; (iii) Technology; and (iv) Structure of schools and classrooms. The types of schools that students attend have small effects on student achievement.

Moreover, a range of school- and community-based programmes have effectively increased school completion. This conclusion has been supported by a Campbell Collaboration review<sup>281</sup> and by a more recent update.<sup>282</sup> The largest improvement in the mean increase of upper secondary school graduation rates in experimental groups compared to control groups was in vocational programmes (16%) and socio-emotional skills training programmes (14%).

Another example is an overview of knowledge-based interventions, which emphasise a preventive approach to problems in the classroom. The efforts can be implemented in the class, they are easy to learn, and are possible to implement and evaluate using common classroom resources.<sup>283</sup> The study presents 83 different

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<sup>277</sup> Nordic Welfare Centre. (2019). Policy briefs to increase equality in health. Stockholm: NWC.  
<http://norden.diva-portal.org/smash/get/diva2:1372681/FULLTEXT01.pdf>

<sup>278</sup> Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Oxon, UK: Routledge.

<sup>279</sup> Hattie, J. A. C. (2015). *What doesn't work in education: The politics of distraction*. <https://visible-learning.org/wp-content/uploads/2015/06/John-Hattie-Visible-Learning-creative-commons-book-free-PDF-download-What-doesn-t-work-in-education-the-politics-of-distraction-pearson-2015.pdf>

<sup>280</sup> Hattie, J., & Hamilton, A. (2020). Real gold vs. fool's gold. The Visible Learning™ methodology for finding what works best in education. Thousand Oaks, CA: Corwin Press.  
[https://www.visiblelearningplus.com/sites/default/files/Real%20Gold%20vs.%20Fools%20Gold\\_FIN\\_AL\\_app.pdf](https://www.visiblelearningplus.com/sites/default/files/Real%20Gold%20vs.%20Fools%20Gold_FIN_AL_app.pdf)

<sup>281</sup> Wilson, S. J., Tanner-Smith, E. E., Lipsey, M. W., Steinka-Fry, K., & Morrison, J. (2011). *Dropout prevention and intervention programs: Effects on school completion and dropout among school-aged children and youth*. Campbell Collaboration: Campbell Systematic Reviews 2011:8.

<sup>282</sup> Hahn, R. A., Knopf, J. A., Wilson, S. J., Truman, B. I., Milstein, B., Johnson, R. L., Fielding, J. E., Muntaner, C. J., Jones, C. P., Fullilove, M. T., Moss, R. D., Ueffing, E., Hunt, P. C., & Community Preventive Services Task Force (2015). Programs to increase high school completion: A community guide systematic health equity review. *American Journal of Preventive Medicine*, 48(5), 23–40.

<sup>283</sup> Burns, M. K., Riley-Tillman, T. C., & Rathvon, N. (2017). *Effective school interventions, third edition: Evidence-based strategies for improving student outcomes*. New York: Guilford Press.

interventions with effects on school performance, learning, behaviour, and social competence. Thus, evidence-based methods are available to improve students' school performance, which then can have a positive effect on children's health and development.

### Development of health promotion among school children

The Nordic countries have somewhat different traditions in how health is included in the school curriculum. Finland has health education as a separate school subject with health literacy as its main objective.<sup>284</sup> The intention is to develop theoretical and practical knowledge, critical thinking, self-consciousness, and citizenship. However, even if the school subject supports the comprehensive development of the child as a critical and active citizen, the tendency is to teach how to behave in a healthy manner.<sup>285</sup> In the other Nordic countries, health is integrated in other subjects such as physical education, home education, biology, and science. Does this have any impact on the health literacy among Nordic school children?

It may be of interest to briefly discuss how health work has developed in the schools. A Nordic perspective is given in a recent report,<sup>286</sup> which includes different approaches focusing on health knowledge, health behaviour, the school as an arena, and development efforts that can be good for both health and school achievement.<sup>287</sup>

One insight is that in school it is not just about knowledge about health work but also about how to use it in practice. For example, the creation of supportive environments is important.<sup>288</sup> Here, social-ecological thinking has become the guiding light: efforts to promote good health behaviours are based on an understanding of how these behaviours arise and how to deal with them in addition to just giving information.

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<sup>284</sup> Paakkari, L., & Paakkari, O. (2012). Health literacy as a learning outcome in schools. *Health Education, 112*(2), 133–152.

<sup>285</sup> Paakkari, L., & Välimaa, R. (2013). Ethical issues in the teaching and learning of health topics in schools: The conceptions of teacher trainees. *Teaching and Teacher Education, 34*, 66–76.

<sup>286</sup> Kolouh-Söderlund, L. (Ed.). (2019). *Adolescent health in the Nordic region. Health promotion in school settings*. Stockholm: Nordic Welfare Centre. [https://nordicwelfare.org/wp-content/uploads/2019/03/NWC\\_Temaha%CC%88fte\\_Skolelever\\_Webb.pdf](https://nordicwelfare.org/wp-content/uploads/2019/03/NWC_Temaha%CC%88fte_Skolelever_Webb.pdf)

<sup>287</sup> The following section is an abbreviated version of an upcoming book chapter: Eriksson, C. (2020). Hälsa och lärande – Utmaningar och möjligheter till en hälsofrämjande skola [Health and learning – Challenges and opportunities for a health-promoting school]. In R. Säljö, & E. Hjörne (Eds), *En hälsofrämjande skolutveckling för en likvärdig skola* [A health-promoting school development for a school for all].

<sup>288</sup> Bonell, C. P., Fletcher, A., Jamal, F., Wells, H., Harden, A., Murphy, S., & Thomas, J. (2013). Theories of how the school environment impacts on student health: Systematic review and synthesis. *Health & Place, 24*, 243–249.

Many programmes now focus on diet, physical activity, tobacco, alcohol, drugs, doping, bullying, friendship, sexuality and coexistence, obesity, dental health, eating disorders, and more. The crucial question is what can strengthen the health promotion work. An example is a research project aimed at enhancing the ability of parents of preschool children to promote children's eating habits and physical activity.<sup>289</sup> The programme, which has showed promising results, has been developed in Sweden and consists of three components: information material, motivational discussions with parents, and a teacher-led classroom component for the students. A strategic consideration is to combine informative, motivational, and social components of the programme.

A shared responsibility is the school environment, which can provide good conditions for students' physical activity and community during the school day. Outdoor periods are good for health. Children's motor development (muscle strength and coordination) and creativity are enhanced by a varied and stimulating outdoor environment.<sup>290</sup> The school yard has in many cases changed from a rest area to an educational room,<sup>291</sup> but densification in larger cities has in many cases meant that the school yard area has decreased.<sup>292</sup>

There are good reasons to make the whole school health-promoting, something that has been going on in many parts of the world. During the 1980s, the World Health Organization (WHO) developed a reference framework for health promotion at school.<sup>293</sup> It was based on a broad perspective on health and is used to develop school-based interventions to promote children's and young people's health.<sup>294</sup>

Today, school health promotion is actively implemented in many countries in Europe and in other parts of the world. The European Network (ENHPS, the European Network of Health Promoting

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<sup>289</sup> Nyberg, G. (2014). En frisk skolstart [A healthy school start]. In L. Schäfer Elinder & L. Kwak (Eds.), *Evidensbaserat folkhälsoarbete* [Evidence-based public health work] (pp. 151–161). Lund: Studentlitteratur.

<sup>290</sup> Mårtensson, F. (2004). *Landskapet i leken. En studie av utomhuslek på förskolegården* [The landscape for play. A study of outdoor play in the preschool (Acta Universitatis Agriculturae Sueciae Agraria 464). Alnarp: Swedish University of Agricultural Sciences.

<sup>291</sup> Paget, S., & Åkerblom, P. (2003). Från rastyta till pedagogiskt rum [From recess area to pedagogical room]. In S. Selander (Ed.), *Kobran, nallen och majjen. Tradition och förnyelse i svensk skola och skolforskning* [Cobra, teddy bear and teach. Tradition and renewal in Swedish school and school research]. Serien Forskning i fokus, nr 12, pp. 245–260. Stockholm: Myndigheten för skolutveckling.

<sup>292</sup> Statistiska centralbyrån SCB. (2018). *Grundskolor och friytor. Nationell kartläggning och uppföljning av grundskoleelevers tillgång till friytor 2014–2017*. Stockholm: SCB.

<sup>293</sup> Nutbeam, D. (1992). The health promoting school: Closing the gap between theory and practice. *Health Promotion International*, 7(3), 151–153.

<sup>294</sup> Shackleton, N., Jamal, F., Viner, R. M., Dickson, K., Patton, G., & Bonell, C. (2016). School-based interventions going beyond health education to promote adolescent health: Systematic review of reviews. *Journal of Adolescent Health*, 58, 382–296.

Schools) is still a strategic programme in Europe with 31 member countries (not Sweden) in the network, now called Schools for Health in Europe (SHE). Since 2017, SHE has been an idea-bound organisation co-financed between the EU and the WHO EURO. A health promotion school is a school that implements a structured and systematic plan for health and well-being, and develops the social capital of all students and all school staff.<sup>295</sup>

Central to the work of SHE at European level are five basic values:<sup>296</sup>

(i) Equality (equal access for all to education and health); (ii) Sustainability (health, education, and development are linked; activities and programmes are systematically implemented over extended periods); (iii) Inclusion (diversity is desirable, and schools are learning communities where everyone feels trusted and respected); (iv) Empowerment (all people in the school system participate actively), and (v) Democracy (health promotion schools are based on democratic values).

The foundations of SHE are the following:<sup>299</sup> (i) The whole-school approach to health promotion (combining health education in the classroom with the development of school policy, the school environment, life skills, and involving all people in the school); (ii) Participation (a sense of ownership of students, school staff, and parents), (iii) School quality (health-promoting schools create better teaching and learning processes and outcomes, and healthy students learn better, healthy staff work better), and (iv) Evidence (development of new approaches and practice is based on existing and new research).

On the basis of the above, a health-promoting school development could actually contribute to equality in the school and thus affect the social inequalities in health from an educational point of view. Two dimensions need to be considered:<sup>297</sup> (1) to create conditions for optimal development through efforts in terms of children's living conditions, the physical and social environment, and adequate service; and (2) to ensure teaching is tailored to the needs of all children, taking into account their personal and social circumstances.

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<sup>295</sup> Turunen, H., Sormunen, M., Jourdan, D., von Seelen, J., & Buijs, G. (2017). Editorial. Health promoting schools – A complex approach and a major means to health improvement. Development of health promoting schools in the European region. *Health Promotion International*, 32, 177–184. <https://doi.org/10.1093/heapro/dax001>

<sup>296</sup> [www.schoolsforhealth.org](http://www.schoolsforhealth.org)

<sup>297</sup> Schools for Health in Europe SHE. (2019). *School health promotion – Evidence for effective action on inequalities*. Fact Sheet 4. Schools for Health in Europe, EU Health Programme. [www.schoolsforhealth.org/sites/default/files/editor/fact-sheets/factsheet-4-2018.pdf](http://www.schoolsforhealth.org/sites/default/files/editor/fact-sheets/factsheet-4-2018.pdf)

What is important to achieve from such efforts? An international overview of success factors summarises: 'The most successful healthy schools are those that are able to explicitly demonstrate a meaningful relationship between education and health priorities, with strong focus on pupil wellbeing and the joint ambition of providing accessible learning opportunities for all pupils to raise achievement.'<sup>298</sup>

The importance of the school to promote children's health and well-being was examined in an overview of published research.<sup>299</sup> The following success factors were identified: (1) the entire school's commitment and consideration of all aspects of school life; (2) efforts for the school's social environment relationships between students, school staff, and parents), and (3) the development of children's life skills.

What are the effects of this type of school development? There are several well-made knowledge summaries to lean on. Interventions of this type, based on several interacting components, have been found to be effective in promoting sexual health and preventing bullying and smoking in school.<sup>300</sup> Health-promoting school initiatives can reduce student body mass (BMI), increase physical activity and fitness, increase fruit and vegetable consumption, reduce cigarette smoking, and reduce bullying.<sup>301</sup> There is limited evidence of the impact on school performance, in part because this has rarely been included as an outcome in intervention studies.<sup>302</sup> Several studies are currently on-going in the Nordic countries that can help to fill this knowledge gap. Swedish research funding agencies have invested in such projects, but the evaluation report has not been published.

A fundamental question is whether school children are given the opportunity to learn the most important skills for life. Is the school's work based on modern knowledge of modern cognitive psychology and neuroscience? Has the postmodern view of knowledge and its relativism contributed to the problems of the school? Some

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<sup>298</sup> Nobl, C., & Toft, M. (2012). How effective are schools as a setting for health promotion? In A. Scriven & M. Hodgins (Eds.), *Health promotion settings. Principles and practice* (pp. 140–152). London: SAGE.

<sup>299</sup> Stewart-Brown, S. (2006). *What is the evidence on school health promoting in improving health or preventing disease and specifically, what is the effectiveness of the health promoting schools approach?* Copenhagen: World Health Organization.

<sup>300</sup> Shackleton, N., Jamal, F., Viner, R. M., Dickson, K., Patton, G., & Bonell, C. (2016). School-based interventions going beyond health education to promote adolescent health: Systematic review of reviews. *Journal of Adolescent Health, 58*, 382–396.

<sup>301</sup> Furley, K., & Goldfeld, S. (2017). The World Health Organization health promoting school framework is important for some child health outcomes. *Journal of Paediatrics and Child Health, 53*, 194–196.

<sup>302</sup> Langford, R., Bonell, C., Komro, K., Murphy, S., Magnus, D., Waters, E., Gibbs, L., & Campbell, R. (2017). The health promoting schools framework: Known unknowns and an agenda for future research. *Health Education & Behavior, 44*(3), 462–475.

researchers believe that it has.<sup>303</sup> The progressive philosophy of education, which had a breakthrough in the Swedish school during the second half of the 20th century, with a focus on joy, school democracy, and student-led teaching, has also been highlighted by other researchers<sup>304</sup>. Success in schoolwork is an important health promotion.

## Knowledge gaps and concerns

- Studies of trends in different indicators of physical and mental health among school-age children and the possible relationships with trends in school achievement are needed in the Nordic countries. Methodological research is required to further explore what influences the observed changes, including the increase in mental health symptoms and complaints among adolescents and especially among girls.
- All health-related studies to understand the trends in physical and mental health need to include gender and socioeconomic status.
- Studies of the relationship between physical and mental health and school achievement are needed from the Nordic countries. These must be longitudinal or intervention studies in order to elucidate the web of causes behind the relationships. Studies using other designs may add to the knowledge base, especially trend studies using repeated cross-sectional designs. Another strong approach would be a longitudinal design with a cohort of children where data on health, school achievement, and other relevant factors is collected every three years. Modern big data procedures would enable researchers to use national data, given proper ethical and logistic concerns.
- Studies of the consequences of physical and mental diseases are needed, especially with regard to long-term impact on school achievement, educational trajectory, and working life.

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<sup>303</sup> Henrekson, M. (Ed.). (2017). *Kunskapssynen och pedagogiken. Varför skolan slutade leverera och hur det kan åtgärdas* [The view of knowledge and pedagogy. Why the school stopped delivering and how it can be rectified]. Stockholm: Dialogos.

<sup>304</sup> Heller-Sahlgren, G., & Sanandaji, N. (2019). *Glädjeparadoxen. Historien om skolans uppgång, fall och möjliga upprättelse* [Joy paradox. The history of the school's rise, fall and possible restitution]. Stockholm: Dialogos förlag.

- Studies of the consequences of differences in school achievement for health and well-being are also needed, both short-term and long-term.
- Comparative studies between the Nordic countries are needed regarding health-promoting processes and their relationship with school achievement. In Finland health education is a separate school subject unlike in the other Nordic countries. This and other structural differences can be investigated using a comparative design with comparable systematic data collection on implementation and effects.
- Collaboration grants could be developed for supporting Nordic researchers to combine on-going national or international data collection for analysis of trends, causal web, consequences, interventions or specific programmes, and implemented policies.

## 5. A provisional list of knowledge gaps and concerns

The following list of knowledge gaps and concerns has emerged during this study.

### **On research methodology**

1. There is a need for studies on the implementation, methods, and sustainability of different educational innovations and measures both under optimal and realistic conditions. Moreover, the scaling up should be based on evidence from practice-based research.
2. There is also a need of systematic review and analysis of multidisciplinary and educational research in many fields. Moreover, such analysis should be used for allocation of research and development initiatives conducted as transdisciplinary research involving school staff, pupils/students, and parents.
3. Innovative models of practice-based transdisciplinary research need to be developed, implemented, and sustained in order to facilitate research and development (R&D) and policy and implementation (P&I) within the school systems in the Nordic countries.
4. There is a need for scientific knowledge, practical knowledge, and practical wisdom to guide further development of the school systems at different levels in the Nordic countries.

### **On the Nordic school systems**

5. The changes in development of the school systems in the Nordic countries offer opportunities for comparative research and quasi-experimental studies related to most policy issues discussed in Introduction 2.
6. Development of a strategy for educational policy renewal should include pilot studies where implementation, effects, and sustainability are evaluated by advanced research

methods including an appropriate mixed-methods approach. If possible, these studies could include participatory approaches and involvement of school professionals at the school level.

7. The Nordic countries have unique infrastructure and competence for doing registry studies. This should be put to further use in educational research and policy-making. By merging different types of registries – education, health, welfare, and socio-demographic registries – it is possible to address more research and policy issues.
8. Although NordForsk investment in education is an important initiative, additional funding is needed for Nordic comparative studies and Nordic research collaboration to generate knowledge related to socioeconomic, gender, and health inequalities and how these interact in generating inequalities in school achievement and school attainment.
9. A comparative longitudinal study could be initiated where a small sample of schools at preschool, primary, and secondary levels from the Nordic countries are developed as a 'policy laboratory'. The aim would be to systematically investigate relevant changes in educational policy and practices.

### **Inequalities in school achievement**

10. The international large-scale assessments offer unique data for analysis of factors related to school achievement. Using more advanced analytical strategies would improve the knowledge state, but the quality of relevance of the content in the assessment should be discussed in detail.
11. The analytical procedure should involve advanced forms of statistical multi-level analysis, as the national comparisons on the aggregated level often disregard the within-country variation.
12. There are many longitudinal studies of children from birth onwards. Mostly these studies focus on health and child development. These could be linked to data from children's school situation and school achievement. This would lead to an important improvement in the possibility to develop a more in-depth analysis of the drivers of inequality in school achievement and educational trajectories.

13. There are also databases on school children, but they lack data on health and other important mediating and moderating factors. The extension of these databases would increase the possibility for research, development, and evaluation of educational practices and policies.
14. Ethical concerns: The ethical issues related to a more in-depth research in this field has been well addressed by the ethical code for research and monitoring of sensitive issues such as health.
15. Political concerns: The political aspects are important to recognise, as selective vested interests may make it impossible to use available resources.

### **Gender inequalities**

16. A systematic review of gender innovations in education in the Nordic schools would be of interest. Moreover, the initiatives should be followed over years to analyse the impact on educational trajectories and the selection of occupation.
17. Educational practice should be researched to uncover the mechanisms behind gender-based inequalities in school achievement. This would include longitudinal studies over many years. Having common theoretical and data collection instruments in the Nordic countries would facilitate such studies.
18. Gender perspectives and gender theories should facilitate the analysis of educational practice and educational systems in the Nordic countries. This is on-going in the higher education and innovation sector, and is included in the mandate for the NORDICORE centre of excellence. A similar initiative would be beneficial for the other levels.
19. Early intervention among pre-schoolers and pupils in the first years in school should be tested in experimental studies where the children in a waiting list school get the intervention later (a year later or more depending on the outcome). It would be beneficial to conduct experimental studies of different teaching methods as cluster-randomised studies where schools with different teaching methods are compared.

20. The school is a working environment for children, teachers, and other school staff. Therefore, it would be important to close the knowledge gap regarding breaks, physical activity, and length of lessons in relation to school achievement and health development among school-age girls and boys.

### **Socioeconomic inequalities**

21. The infrastructure for research on socioeconomic inequalities in school achievement is comparatively well advanced in the Nordic countries. It could be used more extensively in research in this field.
22. Invest in the development of a Nordic database including individual statistics on school performance, educational trajectories, and lifelong achievement.
23. Measures taken to lessen the socioeconomic inequalities in school achievement should be evaluated using the best available research designs.
24. Add, if necessary, more evaluation dimensions in the proposed guidelines given by the JustEd researchers. Use a comprehensive approach where also a child-centred assessment includes the impact on health and well-being.

### **Health development**

25. Studies of trends in different indicators of physical and mental health among school-age children and the possible relationships with trends in school achievement are needed in the Nordic countries.
26. All health-related studies to understand the trends in physical and mental health need to include gender and socio-economic status.
27. Studies of the relationship between physical and mental health and school achievement are needed from the Nordic countries.
28. Studies of the consequences of physical and mental diseases are needed, especially with regard to long-term impact on school achievement, educational trajectory, and working life.

29. Studies of the consequences of differences in school achievement for health and well-being are also needed, both short-term and long-term.
30. Comparative studies between the Nordic countries are needed regarding health-promoting processes and their relationship with school achievement.
31. Collaboration grants could be developed to help Nordic researchers to combine on-going national or international data collection for analysis of trends, causal web, consequences, interventions or specific programmes, and implemented policies.

## Towards a summary

This report has discussed a series of concerns regarding methodology, theoretical perspective, policy aspects, and ethical and political considerations. There is a need for scientific knowledge, practical knowledge, and practical wisdom to guide the further development of the Nordic school systems. This can be achieved by bridging different knowledge gaps through studies of different educational practice, interventions, and measures by [1]<sup>305</sup> using systematic reviews to summarise what is already known [2], doing original comparative research [2,6], using the potential of the unique infrastructure and competence in registry-based research [5,7] as well as the best available evaluative research designs and practice-based research designs [3,5], and increasing research collaboration between Nordic researchers in relevant fields [8] such as educational science, cognitive neuroscience, developmental psychology (developmental science), sociology of education, child public health, and policy science. Moreover, the research should be concerned with ethical and political issues of the selected approaches.

The three perspectives on inequality in school achievement – gender, socioeconomic aspects, and health – are closely related. An intersectoral approach is essential if we are to understand school achievement, educational attainment, and educational trajectory from childhood to adult participation in working life, and quality of life.

Therefore, it is possible to combine some of the proposed study topics in larger research programmes. The suggested topics are grouped into five different complementary categories:

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<sup>305</sup> The numbers within brackets refer to the knowledge gaps and concerns identified in this report.

**Trends: How is the situation?**

The challenge is to analyse trends of different related factors. The analysis of international large-scale assessments and other data sets should always include important constituents such as socioeconomic factors, gender, and health [10,25,26], uncover mediating and moderating factors [11,17], and use relevant theories [18, 24]. A barrier can be that some of these perspectives are missing; in educational databases health is seldom included, while in databases on health, school perspectives are missing.

**Mechanisms: The question why?**

It is important to develop more knowledge about the factors that are related to the observed trends and association. It is important to know how the relationship is between physical and mental health in relation to school achievement and vice versa among Nordic school children [27]. This requires longitudinal studies. Therefore, it would enhance research possibilities if the contents of the available registries and databases were extended to facilitate such analysis. Also, invest in a Nordic database [21], national statistical registers on education [13], longitudinal studies of children from birth onwards [12], and in-depth studies in drivers of inequalities in school achievement [12].

**Consequences: How important?**

Studies of the consequences of physical and mental health as well as diseases are needed especially with regard to short- and long-term impact on school achievement, educational trajectory, and working life [28]. Studies are similarly needed on the consequences of differences in school achievement for health and well-being [29]. The consequences can be seen both from the individual and societal levels in terms of economic aspects and quality of life. This is especially interesting in the Nordic countries, where the welfare state may mitigate such processes. I have found only a few studies with this perspective during my work with this report.

**Interventions: What can we do?**

A starting point is to do a systematic review of the literature [2,16] followed by systematic research and development work. In order to improve the evidence base, the quality of the intervention studies is important. A strategy for educational policy renewal is therefore proposed through pilot studies with experimental design before

large-scale implementation [6]. Moreover, a comparative longitudinal study as a policy laboratory is suggested [9].

There are several challenges in the school systems that could be investigated regarding the effects of different educational interventions. In this report, early intervention among pre-schoolers and pupils in the first years in school [19] has been suggested. Different teaching methods (traditional versus progressive education) could also be analysed in controlled studies [19]. Another vehicle for intervention is the working environment for children, teachers, and other school staff. Here, studies of breaks, physical activity, and length of lessons in relation to school achievement and health development are proposed [20]. Moreover, measures to lessen socioeconomic or other types of inequalities in school achievement should be evaluated using the best available research designs [23]. Such evaluative studies should include child-centred assessment and should address the impact on health and well-being [24].

Also, comparative studies between Nordic countries are needed on health-promoting processes and their relationship with school achievement [30]. Differences in school health services can also motivate comparative studies in this field.

### **Policy and implementation: What can we do on the national level?**

Education for all has been a common educational policy in the Nordic countries. This has been challenged by market-based and privatisation reforms in education that are not central to the Nordic model. There are differences in how the countries and local authorities have tried to lessen the negative impact of such changes. This could be analysed in comparative studies [5] and in the suggested policy laboratory [9]. The proposed improvement in research infrastructure would also improve the possibilities to analyse and evaluate the importance of different educational and other policy initiatives for school achievement, social equality, and health development among school-age children in the Nordic countries.

## Conclusions

This report has outlined different possible actions to address different knowledge gaps. These actions have been presented in five different categories, and their tentative priorities are given in table 9.

Table 9: Tentative priorities of the focus for future research

Focus	Available Nordic research	Tentative priorities
Trends: How is the situation?	Good in certain fields  Better use of data is possible	+++
Consequences: How important?	Limited  Quality of life and economic aspects seldom studied	++
Mechanisms: why?	Associations documented  Too few longitudinal studies	++++
Interventions: What can we do?	More advanced designs are needed for evidence building	++++
Policy and implementation: What can we do on a national level?	Many initiatives are not evaluated  Implementation and evaluation need to be improved	+++

The following measures are suggested to support Nordic research in this field:

1. Collaboration grants for Nordic researchers that can pool data and resources for in-depth analysis of trends, mechanism, consequences, interventions, and policy/implementation.
2. Support infrastructure for Nordic comparative research

3. Research grants to researchers that, supported by systematic reviews of previous research, plan and conduct original research on themes such as:
- School for all in the Nordic countries: trends, challenges, and remedies in the neoliberal era
    - Studies of long-term trends using different databases and repeated cross-sectional studies
  - Mechanisms behind socioeconomic, gender, and health inequalities in school achievement
    - Studies of how academic performance, school satisfaction, mental health, and happiness interact
  - Controlled studies of measures taken to improve socioeconomic, gender, and health equality in school achievement
    - Studies of physical activity, breaks, and school hours
    - Studies of measures to decrease school segregation
  - Studies aiming at improving the working environment in schools, including children, parents, and school staff in research and development
    - Studies of family background and involvement in schools
    - Studies of school ethos, management, and leadership
    - Studies of school health services and special education as means to attaining equality in school achievement
  - Studies of physical and mental health, and school achievement: educational trajectory for children in the Nordic countries
    - Longitudinal studies of school children's physical and mental health and school achievement

- Intervention studies to improve physical and mental health for better school achievement
- Health promotion in schools in the Nordic countries
  - Studies on health as a subject in the curriculum and its implementation
  - Comparative studies of programmes aimed at promoting health and preventing diseases and accidents
  - Studies on whole-school approaches to health promotion in schools
- 4. A research school in this field could be a measure to facilitate the training of the next generation of researchers in the Nordic countries. This could be an important link between senior Nordic researchers that jointly manage the research school.

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