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To cite this article: Jari Metsämuuronen & Anu Lehikko (2022): Challenges and Possibilities of Educational Equity and Equality in the Post-COVID-19 Realm in the Nordic Countries, Scandinavian Journal of Educational Research, DOI: [10.1080/00313831.2022.2115549](https://doi.org/10.1080/00313831.2022.2115549)

To link to this article: <https://doi.org/10.1080/00313831.2022.2115549>



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Published online: 22 Sep 2022.



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Challenges and Possibilities of Educational Equity and Equality in the Post-COVID-19 Realm in the Nordic Countries

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ABSTRACT

The aim of the article is to offer a base for discussions on educational equality from the viewpoint of changes in the world causing widening disparities between pupils and students. The essence and possibilities of educational equity and equality in the Nordic educational realm are discussed from six viewpoints. The outcome is that all children have the moral right to access equal opportunities even though they are different and unique. Second, we cannot find absolute equality between individuals because all individuals are different and unique. Third, we should find political and pedagogical ways in which to handle educational inequalities. Fourth, students who are not motivated and skilled to undertake independent work may be in danger of being left behind. Fifth, the COVID-19 pandemic has exacerbated the differences between students and diminished the possibilities of students who are vulnerable. Finally, new technologies may open new paths to reduce educational inequality.

ARTICLE HISTORY

Received 14 September 2021

Accepted 24 May 2022

KEYWORDS

Equality; equity; educational equity; educational equality; future of equality; Nordic countries

Introduction

Educational equity is valued highly in the Nordic countries, both in practice and in academic writing; in the *Scandinavian Journal of Educational Research* alone, we find 43 articles within the last 5 years discussing different aspects of equity and equality related to educational settings (e.g., Berisha & Seppänen, 2017; Boman, 2021; Chong, 2018; Kirikkaleli et al., 2021; Volckmar, 2018; these are all discussed later in the article). Governments in Nordic countries have been proud of having developed educational systems where the differences in average student performance between the schools were small—if not the smallest in the OECD countries (like in Iceland and Finland; see MoEC, 2019; Schleicher, 2006). Irrespective of the location of a school, we expected a largely similar level of learning outcomes (see discussion in Klette, 2018). However, recent studies have challenged this reality.

In 2017, Nordic Co-operation headlined its press release with “warning signs”: results from the international PISA data revealed growing differences between students from socioeconomically disadvantaged and advantageous backgrounds (Nordic Co-operation, 2017, p. 1). Later, with PISA 2018, it was noted that the differences between schools in Sweden and Denmark had grown (Kavli, 2018). There were also notable differences between capital and rural regions in Iceland and Finland, which, to a large extent, were explained by students’ socioeconomic background and cultural capital, as well as students’ own ambitions and expectations (Nissinen et al., 2018,

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p. 203). In Finland, the discrepancy between the low- and high-performing students had intensified; there were more low-performing students than there had been earlier (MoEC, 2019). Recently, researchers in Finland, Norway, and Sweden have reported increased inequality after two years of the effects of the COVID-19 pandemic. In Finland, the “distance-learning period weakened the equality of teaching and the conditions for learning” (Lavonen & Salmera-Aro, 2022, p. 105) and “problems with life skills, learning difficulties and the study conditions at home increase the differences between the learners” (FINEEC, 2021, p. 12); in Norway, the students had “very unequal access to qualified help ... in their own homes.” (Blikstad-Balas et al., 2022, p. 198); and, in Sweden, “the pandemic will likely increase the inequality in children’s and young adult’s circumstances” (Sjögren et al., 2021, p. 132).

A reasonable question is: are we facing an era of growing educational injustice and inequality in the Nordic countries? If yes, relevant questions worth asking are: what are the reasons behind the possible phenomenon, and what possible trends may result regarding the phenomenon? This article discusses educational equality and equity from the viewpoint of some relevant reasons behind the phenomenon. The essence, possibilities, and future of equity and equality are discussed in the educational realm from the viewpoint of Nordic countries. Rather than being an empirical work, the aim of the article is to offer a base for discussions of educational equality from the viewpoint of changes in the world causing widening disparities between different groups of people.

Six questions are addressed in this article: (1) What kind of equity and equality are we talking about in the educational realm: numerical, proportional, formal, or moral? (2) How are the obvious paradoxes of equity, such as offering equal opportunities to all students that allow some students to reach higher outcomes and leave some others with lower outcomes, seen in the educational realm in Nordic countries? (3) How does the modern ethos of individualism challenge educational equality? (4) How do the contemporary practices related to constructivist learning theories challenge educational equality? (5) How has the COVID-19 pandemic affected educational equality? (6) How do technological developments challenge and offer possible solutions for educational equality?

In examples of learning outcomes, mainly mathematics is used as an example. This is justified, first, by recent results that are relevant from the equity viewpoint. Second, mathematics is one of the key skills needed in modern society (Metsämuuronen, 2017; Metsämuuronen & Nousiainen, 2021). Hence, it is a relevant school subject from the perspective of the current discussion.

Question 1: What kinds of equity and equality are we seeking in the educational realm?

Equity and equality

Although the concepts of equity and equality are often used interchangeably (see discussions in Espinoza, 2007; Metsämuuronen, 2019; Paananen et al., 2019), from the philosophical viewpoint, equity is a *value* and *principle* that has to do with justness and fairness, while equality can be interpreted as the *degree or the state of being equal*, especially regarding one’s status, rights, and opportunities (Metsämuuronen, 2019). Some global actors, such as the OECD and UNESCO, continue to use the term “equity” instead of “equality” in their papers and reports (see OECD, 2013a, 2013b, 2013c, 2013d, 2014a, 2015; Sherman & Poirier, 2007; UNESCO, 2011) even though, in some cases, “equality” may also be an appropriate concept (see the discussion in Metsämuuronen, 2019).

When it comes to equity, in most societies around the world, we tend to think that all humans, by virtue of being people, should be treated in a just and fair manner, as implied in the Universal Declaration of Human Rights (UN, 1948; see also Arneson, 2014). We can also call this “basic equality” (see Arneson, 2014; Nathan, 2014). Measuring the degree of equity, that is, equality, makes sense only if equity is accepted as a value and principle (Metsämuuronen, 2019). As a blunt example, measuring equality between junior and senior citizens, as an example, makes sense only when we think that junior citizens *should* be treated equally with seniors. This, however, contradicts the values

of many Asian and African societies where seniority is valued more highly than individuality. Hence, although the Universal Declaration of Human Rights is ratified by many countries, it has faced criticism in this respect (see a summary critique in, e.g., Constantinides, 2008).

Within the educational realm, we may talk about educational equity. Levin (2010) defines educational equity as fairness in access to opportunities to benefit from education. In practical educational settings, in Nordic countries, we value equity for all children in the sense that they should all have an equal right to be treated fairly and justly even though there may be obvious differences in their cultural background, gender, economic status, race, or religion. An example indicator of equity is the student–teacher ratio: students should have equal opportunities to learn in small enough classes that they can have a decent number of interactions with the teacher (e.g., Metsämuuronen, 2019; Sherman & Poirier, 2007). Likewise, an example indicator of equality is gender parity or equality between genders: equality between males and females—to simplify the issue—makes sense in the context of the expectation that the genders *should* be treated equally.

The idea that everyone has a right to equal opportunities to benefit from education, as described by Levin, is deeply embedded in the (educational) cultures of the Nordic countries (see, e.g., Klette, 2018). “Equal opportunities” and the related scaffolding routines refer, among others, to such practicalities as free schooling, free meals, and free textbooks, and support in studies for those who come from disadvantaged backgrounds. Although Levin’s definition does not offer possibilities to operationalize educational equity in an unambiguous manner, from the viewpoint of Nordic countries it is understandable because this may be the *only* kind of equity we can offer to our citizens, the reasons for which are discussed below.

Philosophers have made more nuanced differentiation between the concepts related to equity and equality. Dann (1975, p. 997), Gosepath (2021), Menne (1962), and Westen (2014, pp. 39, 120) discuss the terms “equality”, “identity”, and “similarity”. “Equality” implies correspondence between a group of different objects, persons, processes, or circumstances that have the *same* qualities in at least one respect, *but not all* respects. That is, the individuals have something in common regarding at least one specific and important feature, but there are differences in other features. Then, “equality” should be distinguished from “identity”, which refers to differences between individuals regarding one or more specific features, and it should also be distinguished from “similarity”, whereby cases are similar regarding all or most features. Distinguishing these concepts from each other becomes important when trying to understand why the thinking in Nordic countries favors individuality over equality; this matter is discussed later. We may also ask, as does Temkin (1993; see also Rae & Yates, 1981, p. 132; Sen, 1980), what *is* equality and what is *inequality*? When we are seeking equality, what *kind* of equality are we talking about? Equal in *what* respect?

Varieties of equality

Equality is one of the most perennially discussed values in the course of history. Classic philosophers, such as Plato in his *Law* and, specifically, Aristotle in his *Nicomachean Ethics* (Aristotle A) and *Politics* (Aristotle B), discussed and formalized three kinds of equality that are still valid today: (1) *numerical equality* (“give all the same load”; Aristotle A, 1130b–1132b; see also Plato, VI.757b–c); (2) *proportional equality* (“give all what they can carry”; Aristotle A, 1130b–1132b; see also Plato, VI.757b–c); and (3) *formal equality* (“give the like cases the same load”; Aristotle A, V.3.1131a, 10–b15; Aristotle B, III.9.1280a, 8–15, III.12.1282b, 18–23). Later, philosophers such as Locke (1690), Rousseau (1755), and Kant (1785, 1797) discussed a fourth type of equality: (4) *moral equity* (“everyone deserves the same dignity and the same respect”). Rae and Yates (1981) noted that, in any historical context, no single notion of equality is superior to others.

A treatment is *numerically* equal when it treats all individuals as indistinguishable. In the educational realm, we may expect equal length of the school year within a country in all schools and numerically equal minimum number of teaching hours to be attended. Although numerically

equal treatment is technically fair, it is not always just, and it may lead to inequity. A blunt example of an unjust numerical equality in the educational settings is as follows: if we expected equally long school days from seven-year-old children and 16-year-old adolescents, we would certainly feel that this is not fair. Why would it not be? Because 16-year-old students differ hugely from seven-year-old children in, for example, their ability to concentrate on a task for longer periods of time, we do not feel unjust when expecting longer working days from them. We understand that the same number of hours in school and equal number of tasks or pieces of homework with the same level of difficulty would be numerically equal but not fair for the younger children. In educational settings, it would be more just if all students at the *same grade* are treated numerically equally if there is no other rationale (such as serious learning difficulty) for expecting different output from different students.

A treatment is *proportional* and *formally* equal when it treats all *relevant* people fairly in relation to their circumstances (Gosepath, 2021). Proportional and formal treatment is just when factors address unequal treatment or distribution because the people are unequal in *relevant* respects (for example, their age or maturation). In educational settings, we can claim that all students at *different grades* should be treated as *proportionally* equal and students with *the same grade* as *formally* and numerically equal. Proportional equality is relevant also when we expect a different output from different students at the same grade if there is a relevant rationale for that (such as serious learning difficulty). In Finland, three-staged support for pupils is an example of proportional or formal treatment (for the practicalities, see Chong, 2018): all pupils receive general support from the teacher when needed but, when more or continuous help is needed, intensified support can be given. If the need is serious, special support can be given. In all cases, we expect that students reach the common goals set for all students in the national curricula.

To illustrate the differences between and challenges embedded in numerical and proportional equalities, let us consider modifications of a widely known but sometimes wrongly understood illustration provided by Craig Froehle (2012, Figure 1a) and modified by Paul Kuttner (2016, Figure 1b), whereby three individuals are trying to watch a baseball game over the fence surrounding the baseball field. With the provision of boxes to stand on, they can all see the game. Froehle's original illustration, "an accidental meme" according to him (2012), included some unintended defects, such as comparing *different-sized* individuals trying to watch the game. Professionals in the field of equity noted (see Kuttner, 2016) that this leads to an embedded idea that, originally, the reason for the inequality lies in the metaphoric "physical" features and not in where they started from.¹ Hence, Froehle's graph faced serious criticism and Kuttner (2016) modified the illustration (Figure 1b) so that the individuals are the *same size*. The point in the latter cartoon is that the comparison makes sense only if the humans are equal in some feature (here, in size). The attributes of "equality" and "equity" often seen in the cartoons, although Froehle did not use those in the original meme, have been replaced with more apt attributes, that is, "numerical equality" and "proportional equality".

Although the idea behind Figures 1a and 1b is widely used and has varied (see the discussions and examples in Froehle, 2012, Kuttner, 2016), the original cartoons still seem to embed a somewhat unethical idea that all people, even those not buying a ticket to a baseball game, have a right to see the game. Therefore, here, the cartoon has been modified (Figure 1c) to include the idea that the watchers of a game or concert have already paid for their ticket, and therefore have

¹Kuttner (2016, p. 2) explains the challenge as follows:

In the graphic, some people need more support to see over the fence because they are shorter, an issue inherent to the people themselves. That's fine if we're talking about height, but if this is supposed to be a metaphor for other inequities, it becomes problematic. For instance, if we return to the school funding example, this image implies that students in low-income Communities of Color and other marginalized communities need more resources in their schools because they are inherently less academically capable. They (or their families, or their communities) are metaphorically "shorter" and need more support. But that is not why the so-called "achievement gap" exists. As many have argued, it should actually be termed the "opportunity gap" because the problem is not in the abilities of students, but in the disparate opportunities they are afforded.

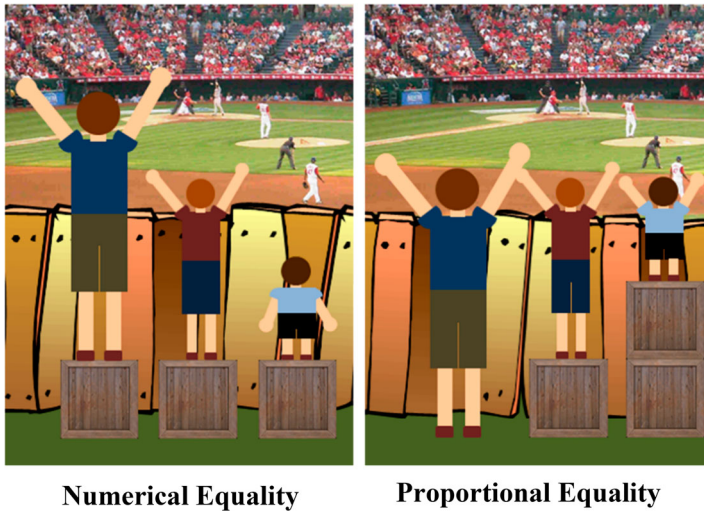


Figure 1a. Original illustration by Froehle (2012), renamed (used with permission).

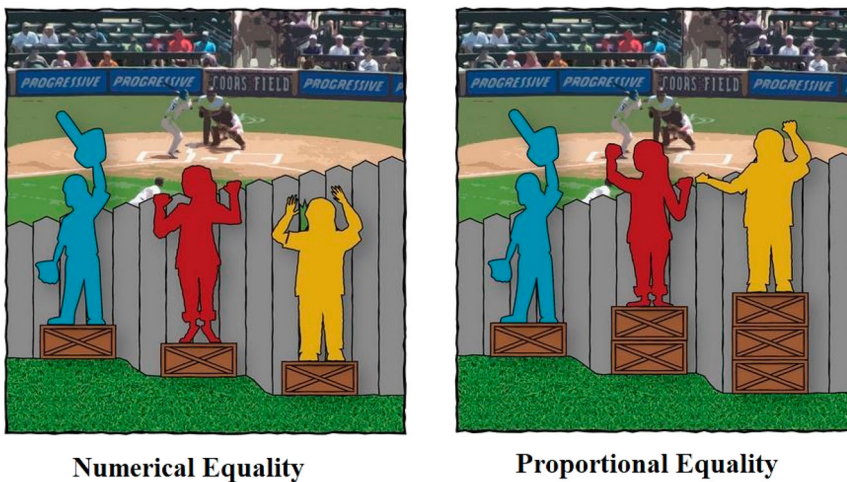


Figure 1b. Illustration by Kuttner (2016) based on Froehle (2012; used with permission).

the right to see the game or concert, but have been placed behind tall people who hinder their view. This refers to the idea that comparison makes sense only if the humans are equal in some *relevant* feature: here, not only their size but because they have a *right* to enjoy the same advantages as others who are in the same position, such as being citizens of a country. This issue is discussed later.

When it comes to proportional equality (“give all what they can carry”) and formal equality (“give the like cases the same load”), the differences are somewhat obscure; in his latest revision, Gosepath (2021) does not separate them from each other as he did in the earlier version of his text. Formal equality remains a somewhat empty concept if it is unclear when or on the basis of which features individuals should be considered equal. Then, when seeking justice, one needs to discuss which cases are equal and which unequal (Aristotle B, 1282b 22). In educational settings, we usually think that students in the same category, such as in the same grade, should be treated as “like” cases. Thus, students in the same grade are assessed and evaluated according to the same rules. Hence, we seem to seek formal equity within the grades. However, some students in the same age cohort, demonstrating

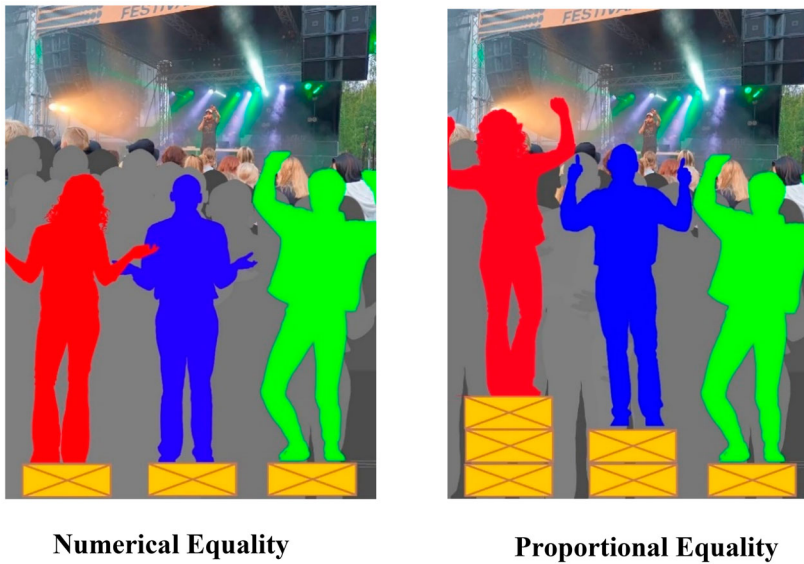


Figure 1c. Illustration of numerical and proportional equality (modified from Froehle, 2012 and Kuttner, 2016; original photograph by Jori Mäenpää; used with permission).

very low performance, are sometimes assessed according to a “personal” curriculum, which means that the requirements are lowered considerably. In this case, we seem to seek proportional equality.

In conclusion, we may admit that all children have the *moral right* to access equal opportunities even though all children are different and unique; that is, they have “basic equality” (see Arneson, 2014; Nathan, 2014) in terms of being able to claim to be treated justly and equally. Therefore, we are willing to offer all children equal possibilities to achieve their optimal level of success and, hence, we are driven by *moral equity* in the sense of Locke, Rousseau, and Kant. This value and political will in Nordic societies is recorded in laws and acts and it is usually operationalized in the national curricula/curriculum of different subjects and topics. Then, in practical educational settings, we would like to see *numerical equality to some extent*: for example, we expect an equal length of school year within a country for all schools and a numerically equal minimum number of teaching hours to be attended. However, in most cases, we expect to find *proportional and formal equality on the basis of moral equity*; that is, in each age group, all children should be given equal opportunities to learn because learning is one of children’s basic rights.

Question 2: How are the obvious paradoxes of equity seen in the educational realm in Nordic countries?

Metsämuuronen (2019) discusses five paradoxes, oddities, and complexities in equity and equality. These are discussed here from the viewpoint of the educational realms in Nordic countries. First, the *world is not equal* in the absolute sense. Tugendhat and Wolf (1983, p. 170) and Gosepath (2021) remind us that two non-identical objects are *never completely equal*. Whenever we see “uniqueness” or even slightly different features in two separate individuals, they are no longer equal. The differences are a basis for *uniqueness*, which, in Nordic countries, is taken in a positive sense. Hence, it is important to distinguish “equality” from “identity” and “similarity”; that is, to say that children should be equal is not to say that they should be identical. In Nordic countries, a strong ethos of individualism and personal characteristics lying behind success is combined with a strong social-democratic tradition of supporting those who are most vulnerable and who have been given less than others. Hence, from the identity viewpoint, we do not seek equality in Nordic countries.

Maybe, closer to the ethos in Nordic countries, is the idea of equal opportunities to become the best *individuals* we could be.

Second, it is worth noting Levin's (2010) statement that *there is no natural state of educational equity*: "Each society may define educational equity in different ways and use different criteria for assessing equity in the overall population and among different groups" (p. 4). Hence, we cannot demand that educational equity be based on the same values in every society. However, some of the values behind "basic equality" are widely shared in the form of the Declaration of Human Rights (UN, 1948). In Nordic countries, this is not an issue; people in these countries share, largely, the same values in terms of seeking the best for a child irrespective of gender, family background, language, religion, or place of birth. However, in cultures showing great respect for seniority, for example, the opinions of older individuals are valued much more highly than those of young people. Should we take that as a sign of inequity against younger citizens? From the Declaration of Human Rights perspective, yes, but morally and ethically maybe not.

Third, in many real-life processes, *we do not follow the rule of "absolute equality" between individuals* because of obvious differences in individual capabilities, resources, responsibilities, powers, or individual characteristics such as motivation, interests, or talents. One example of this, is the choices available to pupils in the school curriculum: the goals are handed down as norms from above. Younger pupils have little say in the matter but older students have much more freedom in selecting school subjects on which they want to concentrate. Hence, when children grow older, they have more possibilities to engage in such debates; that is, they are awarded greater equality. However, this logic should not be used irresponsibly by generalizing it to society as a whole; all citizens should be equal partners in societal dialogue regardless of their economic, educational, cultural, or racial background, for example. This leads to the next complexity.

Fourth, it seems that *some of us are simply luckier* than others. For example, taking all children in the world, the odds of being born in one of the Nordic countries—specifically in Norway or Finland (to say nothing of Iceland) with relatively sparse populations—with a relatively advantageous start in life are very small. According to the UN (2022), around 0.002% of all babies born in the world are born in Nordic countries while around 30% are born in countries offering notably fewer possibilities in life. It is also good to note that, even within Nordic countries, some citizens just happen to be born in more disadvantaged families than others: in terms of geographic location or as a result of inherited learning difficulties or a serious anomaly in prenatal development. Is this randomness injustice, inequality, or just "bad luck"? Maybe all these are true depending on our position behind or inside the "fence" (see Figures 1a–1c and the related discussion); this is the reason we discuss the need for equality of *opportunities* (see later). Anyhow, it is worth noting that, within a country, this kind of "happen to be born" argument cannot be used as a rationale for inequality between races, religions, and genders, or between disabled and "abled" children (see Arneson, 2001; Hurley, 2001; Metsämuuronen, 2019). Another aspect of the challenge presented by the "lucky incident" argument is that *the same circumstances may lead to very different outcomes* depending on random acts or the capacity and motivation of an individual—this leads to the next complexity.

Finally, it seems that some people can *use their capacity and resources better* than others. Rawls (1999, pp. 86–92) and Sen (1989), for example, have discussed this dilemma of capacity and equality. Bandura (2001, 2006) and Hitlin and Elder (2007), among others, suggest using the concept of "agency"; that is, an individual actor's engaged response to situational circumstances, in understanding human behavior in this respect. Bandura (2006) sees the human agency behind human development, adaptation, and change; people are contributors to their life circumstances, not simply products of them. Hitlin and Elder (2007, p. 175) define agentic actions as those the ostensible origin of which begin within the actor; this covers behavior ranging from automatic (e.g., throwing a ball) to carefully considered (e.g., solving a mathematical problem) to long term (e.g., enrolling in a particular university). Based on this framework, we may say that individuals are active users of their capacity and resources.

However, Metsämuuronen (2019) notes that if we could, in some magical way, organize the world so that all humans receive identical education and a perfectly equal level of knowledge, we would soon find ourselves in a situation whereby some of us have learnt more and others have lost elements of their knowledge. As individuals, we differ from each other in terms of our motivational structures, interests, values, goals, talents, skills, and mental capacities—and, in Nordic countries, we even support these differences as our culture tends to be highly individualistic. All these deviating characteristics obviously have an effect on the seemingly unequal outcome of the educational paths followed by and futures of individuals. Rawls (1999) condenses this paradox into “equality of opportunity means an equal chance to leave the less fortunate behind in the personal quest for influence and social position” (p. 91). That is, when we allow equal opportunities for *all* to study, we also allow some to study more, harder, longer, or with greater motivation than others. The outcome will be unequal positions between individuals.

The bottom line is that, even if we may find common universal human values and beliefs on which it is possible to build common criteria for equity and equality, we may face one paradox more: we cannot find absolute equality between individuals because all individuals are different and unique. Then, what are we, in reality, seeking for and offering to pupils and students? It seems that, at best, we can offer *equal opportunities* (see Rawls, 1999, pp. 73–78). It seems that this is the degree of equality we can offer in Nordic countries.

When evaluating the status of equality in Finland 20 years ago, Jakku-Sihvonen and Kuusela (2002; see also Thorlindsson, 1988 for Iceland) noted that, even though we see individual differences, equality in opportunities should still be embedded in our educational policies. Although we expect to see individuals who differ from each other, we should not expect to see structural and systematic inequality between groups of individuals who we assume to be equal in the opportunities available to them. We should not find systematic differences between genders, language groups, ethnic groups, religions, socioeconomic groups, or geographical areas when it comes to learning outcomes. Whenever we find true differences between groups that supposedly should be equal, something is wrong with the system. It means that educational policies and practices are not able to correct the inequalities the children carry with them when they start school. Practically speaking, if we find, for example, a true difference between boys and girls in achievements in mathematics such that girls are at a lower (or higher) level than boys, shouldn't we be worried about the equality of genders? If yes, why? If no, why not? This is discussed in the next section.

Question 3: How do individual differences and personal choices challenge educational equality?

Children, pupils, and students will always differ from each other because they have, among other factors, different genetic and socioeconomic backgrounds, motivational structures, and temperaments; they may also experience different developmental phases although being the same age (Ukkola et al., 2020). Some of these factors are difficult, if not impossible, to influence. As an example, inheritance of education is one of the most oft-repeated observations in educational settings, although the mechanisms are not always obvious; children with more highly educated parents tend to advance in schooling and further education (e.g., OECD, 2014b, 2015, 2016). This advantage inherited from the parents' educational background may be intellectual, academic, social, and economic (Metsämuuronen, 2017; Ukkola et al., 2020). As another example, learning disabilities tend to be inherited: if either parent has a reading disability, the risk of their child inheriting a reading disability is four times higher (Eklund, 2017). Also, certain types of learning disability coexist, that is, they appear together (e.g., Fuchs et al., 2019); for example, ADHD often co-occurs with dyslexia and dyscalculia (Monuteaux et al., 2005; Willcutt et al., 2010). In Finland, 6.7% of pupils were evaluated to be in need of intensive support and 3.6% already in need of special support *before* school age; of these pupils, 71% were boys (Ukkola et al., 2020). Then, because of differences in basic

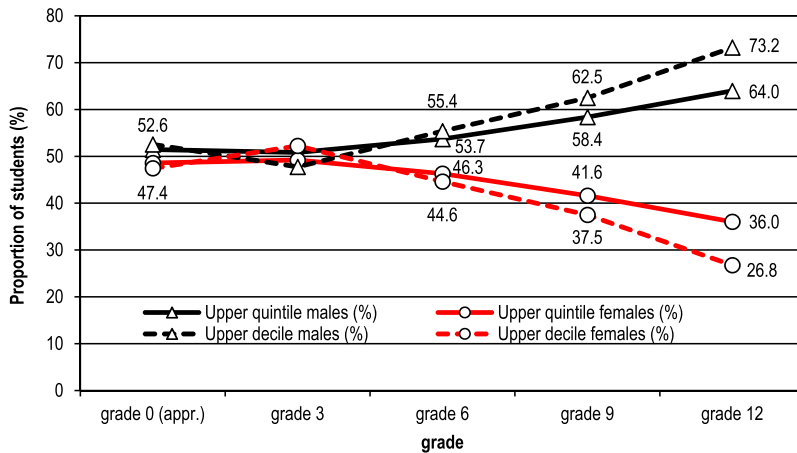


Figure 2. Proportion of males and females among the highest achieving students through the school years (Metsämuuronen, 2017, p. 76; cl. Metsämuuronen & Tuohilampi, 2017, p. 66).

preconditions, there will always be differences in learning outcomes, knowledge base, and skills even between groups of individuals we hope to be at the same level.

Some individual characteristics affecting equality can be influenced by students, teachers, or society. Some of these relate to individual interests, motivation, and selection of subjects on which to concentrate. One generally known disparity between students is the division of boys and girls in reading and writing skills; all major international studies point out that girls outperform boys (e.g., OECD, 2019). This cannot be caused by differences in intellectual capacity but, rather, by selection of subjects on which to focus. According to the PISA 2018 report: “Gender-related disparities in achievement ... appear to be neither innate nor inevitable” (OECD, 2019, p. 142).

Metsämuuronen (2017) discussed an opposite gender disparity from the viewpoint of development in achievement in mathematics based on a longitudinal dataset where the same pupils and students were studied from the beginning of schooling to higher secondary education in Finland. Regarding achievement in mathematics, the proportion of girls among the highest achieving students decreased gradually over the years (Figure 2). At the end of secondary education, only 27% of the highest achievers were female. It is obvious that this imbalance between males and females within the best performers is not caused by differences in intellectual capacity but by something else. It seems that girls, at a very early age in school, start to focus on subjects other than mathematics. In South Korea, this phenomenon has been given a name, *supoza* (“giving up mathematics”) (Ko et al., 2021).

For many girls, specifically those at higher grades, preferring some other subjects instead of mathematics to concentrate on may be, for good reasons, a personal choice. On one hand, this choice may be made consciously, based on students’ own interests, optimizing their high scores in the latter years of compulsory or secondary education to then focus on subjects that really interest them; however, it may also be linked to lack of exposure to STEM (science, technology, engineering, and mathematics) career possibilities and the creation of interest in this area (see e.g., BeTech, 2022). On the other hand, selection can be unconscious, based on, for example, low self-esteem in relation to mathematic ability developed during school years (see discussion in, e.g., Metsämuuronen & Tuohilampi, 2014; Williams & Williams, 2010). However, “giving up mathematics” leads to an important structural inequity in society because female students are thereby restricting later possibilities in selecting certain areas in further education and jobs. When there are fewer females among the highest achieving students in mathematics at the end of compulsory education, they tend to be equally rare in the STEM subjects in universities and, hence, have less

chance of following technical vocations. This is apparent in Finland, where, according to Finland Statistic (2015), of students graduating in technical areas in universities, only 25% are female. This percentage is almost the same as that among the highest mathematic performers at the end of secondary education.

A relevant question to ask is, on the one hand, whether this personal selection, which clearly restricts later choice of career, is originally based on future-oriented thinking of girls in the lower grades? On the other hand, why should females not be entitled to choose careers in the humanities, such as in languages, arts, caring, and social work, rather than mathematics and engineering? If we presented this question to Altonji and Blank (1999), Blau et al. (2010), Crawford and Cribb (2013), or James (2013), they would say that the *matter is important simply because of the money*: higher achievement in mathematics in school is related to higher salary in future occupation. Therefore, even if the reasons for the differences in mathematical ability of boys and girls may be understandable and obviously related to individual choice, these differences remain one of the main sources of societal inequality between genders. Should we do something to address this situation within school or during early child care? If we should, *what* should we do?

Two factors related to the families of pupils and students are discussed here. First, and obviously, pupils and students in basic education do not make educational choices independent of their families. Even in Finland, where differences between schools are among the smallest in the OECD countries, researchers have noticed that certain areas within larger cities are remarkably segregated in terms of student achievement (e.g., Berisha & Seppänen, 2017; Bernelius & Vilkkama, 2019; Metsämuuronen & Nousiainen, 2021). Moreover, to an extent, this has led to segregation based on ethnic background (Bernelius & Vilkkama, 2019; Saikkonen et al., 2018). The same phenomenon is also evident in Sweden (see, e.g., Boman, 2021) and may be creating even more challenges than in Finland.

Second, Persson (2010), among others, has discussed the side effects of inclusion in education in Sweden. Inclusion, in general, is just: providing all students with an equal opportunity to access the same form of education (see discussion in Chong, 2018, regarding the Finnish reality). However, whether the inclusion of students with various kinds of school-related difficulties may have created a disadvantage for other students is a much debated subject. This also seems to be the case in other Nordic countries: when more of teachers' time is spent with disadvantaged students, there is less time for those without specific needs (see Sortkær, 2018). In Sweden and Finland, this seems to have led parents to choose different schools for their children when the proportion of, for example, immigrant pupils exceeds a certain level (see Andersson et al., 2010; Vilkkama, 2011).

It is understandable that families have the right to move to areas in which they want to live and can afford the housing. However, if the reason for moving is to select a "better" school for their child, this "school shopping" may have a negative effect on the overall heterogeneity of the student body within a school. If the highest performing pupils and students are missing from a school, the rest may never see the effects of hard work and motivation in relation to study. Nevertheless, the phenomenon of school shopping possibly occurs only in bigger cities. In most geographical areas in Nordic countries, there may be only a couple of local schools to select from. Technological advances related to distance learning and teaching may change this. This issue is discussed later.

We may ask whether children have the "right" to achieve good results (if they want to)—or, at least, to receive such instruction that will help them reach their full potential with given genetical preconditions—in any school they attend, irrespective of its location or ethnic structure. In Nordic countries, we used to presume that this is indeed the case. However, contemporary practices in the classrooms may not support equality in this regard. This is discussed in what follows.

To conclude, Jakku-Sihvonen and Kuusela (2002) note that, while individual differences may be unavoidable, we should find political and pedagogical ways to handle inequalities in the educational realm. It might also be worth asking if learned attitudes or beliefs, rather than "natural differences", could be holding some pupils back in terms of becoming more engaged in studying mathematics as a school subject or achieving better grades. Self-efficacy, one of the competences evident in a

democratic culture (see Council of Europe, 2016, p. 11), reflects personal beliefs about one's ability to successfully undertake a task or reach a certain goal (Bandura, 1997). In mathematical achievement, for instance, there is evidence that both student self-efficacy and perceived emotional support from the teacher contribute to higher student motivation and grades (e.g., Skaalvik et al., 2015).

Question 4: How do common practices related to the constructivist learning environment challenge educational equality?

It seems reasonable to predict that a new complexity or paradox of educational equality is awaiting us in future if we do not change course. This challenge is related to the contemporary practices of (social) constructivist learning theories based on Jerome Bruner's cognitive constructivist perspectives (Bruner et al., 1956 onwards; see literature in Metsämuuronen & Räsänen, 2018) and Lev Vygotsky's social cultural perspectives (Vygotsky, 1971 onwards).

Constructivist learning theories and constructivism have superseded, practically speaking, naturalistic approaches such as behaviorism and cognitivism in educational practices and discourse (see the discussion and a review of literature in Metsämuuronen & Räsänen, 2018). There are several reasons for this. One is that constructivist practices encourage students to be active learners rather than passive learners. The basic tenet of constructivism, that "people construct their own understanding and knowledge of the world through experiencing the world, and reflecting on those experiences", as expressed by Harasim (2017, p. 62; the idea originates from Bruner, 1961), has radically changed thinking concerning being a teacher and being a learner. As concepts, "teacher" and "teaching" have expanded to include consciously organized teaching materials, including books, articles, online materials, lectures, or lecture notes (see Biesta, 2013, 2016; Metsämuuronen & Räsänen, 2018). In modern curricula, the key to learning is that learners set their own goals and solve problems both independently and with others; learning is about doing things alone and together, thinking, planning, and exploring, and assessing these processes in a versatile manner (see, e.g., FNAE, 2014, p. 17). From the learner's viewpoint, within the constructivist view, the "passive receiver" is now an "active seeker" and "constructor of knowledge". In many cases, this is a major step forward in the educational realm.

However, this is not true for those children and adolescents who do not have the capabilities or motivation needed for active processing of information. From a pedagogical point of view, it is evident that some children and young people still need more support and guidance from teachers than others, and many types of pedagogical solution are needed to support learning (Metsämuuronen & Seppälä, 2022). A new Compulsory Education Act in Finland (active from 1.8.2021 onwards; FINLEX, 2021), which expanded compulsory education from 16 to 18 years of age, has challenged and will challenge this issue in vocational education. Although the aim of the new act is good in the spirit of "education for all" (see UNESCO, 1994), that is, to provide all adolescents with a qualification for some type of occupation, the practicalities need a lot of work. The responsibility for studying is placed on students, some of whom may have huge difficulty managing their own life in general, to say nothing of their level of motivation and ability to seek new information or organize placements for practical training. Hence, it could be that we are on the brink of experiencing a new kind of Matthew effect (those who have more will gain more than those who have less): those students who are motivated and have the necessary skills to conduct independent work gain a lot but those without such skills and characteristics are in danger of being left behind if we are not active in using different pedagogical solutions for different types of students.

It should be noted, though, that any theoretical framework for learning, such as constructivism, cannot be held responsible for the practices that manifest in the daily life of schools. The role of the national steering mechanisms (such as a national curriculum or funding principles), education providers, and teachers is to ensure that the principle of proportional equality is at least recognized and followed throughout the educational system. Nevertheless, the challenges in practices related to pupils and students as "active seekers" and "constructors of knowledge", on one hand, and

vulnerability of underdeveloped national and local practices in emergency situations, on the other, seem to have been actualized during the COVID-19 pandemic.

Question 5: How the COVID-19 pandemic challenged educational equality

Globally, the COVID-19 pandemic from early 2020 onwards “created the largest disruption of education systems in history” and exacerbated “pre-existing education disparities by reducing the opportunities for many of the most vulnerable children, youth, and adults—those living in poor or rural areas, girls, refugees, persons with disabilities and forcibly displaced persons—to continue their learning”, according to a United Nations policy brief (UN, 2020, p. 2). Also, in Nordic countries, the COVID-19 pandemic and the desperate measures that were taken to prevent a widespread outbreak led to a situation whereby teaching could no longer continue as before: schools were forced to switch to distance learning virtually overnight, without time to prepare instructional technology infrastructure and suitable new learning materials or train teaching staff. This led to a new source of inequality in education.

Literature related to the effects of the COVID-19 pandemic is numerous and hence, here, only some relevant sources are referred to; in the ERIC database, for example, there are more than 6000 publications concerning different aspects of COVID-19. Country reports by the OECD (2020a, 2020b, 2020c, 2020d, 2020e) show that, excluding the non-compulsory part of the curriculum, each week of school closures represents about 2.5–2.9% of annual compulsory instruction time. The number is the highest in Iceland (2.9%) and the lowest in Denmark (2.5%). In a recent report on the effects of the COVID-19 pandemic in different countries (Reimers, 2022), [Lavonen and Salmerá-Aro](#) noted that, in Finland, “the distance-learning period weakened the equality of teaching and the conditions for learning” (p. 105). In Norway, [Blikstad-Balas et al.](#) noted the unequal access to qualified help at home, which challenged “some of the core ideals of ... equal opportunities to learn” (p. 177). In Sweden, negative impacts were noted by [Sjögren et al.](#): “It is too early to draw firm conclusions about the long-term consequences of the coronavirus pandemic, and yet our overall conclusion is that the pandemic has negative consequences for many children and young adults” (pp. 1–2).

In Finland, inequality related to mathematics skills at the population level, “population disparity” in the typology of indicators of educational inequality by [Metsämuuronen \(2019\)](#), as an effect of COVID-19 was reported. After comparing the national distributions of mathematics achievement at grade 9 in years 2012, 2015, and 2021, [Metsämuuronen and Nousiainen \(2021\)](#), pp. 57–58) noted that, unlike in 2012 and 2015, the students in 2021 were clearly divided into *three populations* regarding their overall mathematics skills: those with a low score, those with an extremely high score, and a population with an average score between them (see [Figure 3](#)).

[Metsämuuronen and Nousiainen](#) found three reasons for this non-normal distribution, one of which was the COVID-19 pandemic, including its exacerbated effects on those with limited self-directional skills, who received less optimal guidance at home and were poorly motivated in terms of individual work. [Metsämuuronen and Seppälä \(2022\)](#), p. 5) commented on this result:

[I]n addition to many other factors, what the pupils in the group with the poorest knowledge and skills described above had in common also was parents with a lower level of education and a lack of traditional higher SES class indicators in the home.

They come to the same conclusion as [Sjögren and colleagues in Sweden](#): that is, that even if the long-term effects are not yet known, the overall effect has been negative from the perspective of equity: “although it is obvious that a learning gap did emerge during the COVID-19 pandemic, we have less knowledge of how ... permanent this gap is” ([Metsämuuronen & Seppälä, 2022](#), p. 3).

All in all, it seems evident that, when pupils and students needed to study at home during the lockdowns, those who were motivated, self-regulated, and received strong support from their family

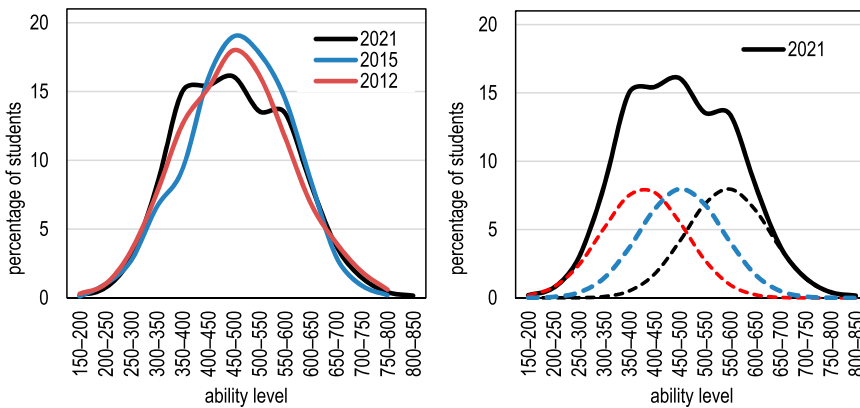


Figure 3. Comparison of national distributions of mathematics achievement in years 2012, 2015, and 2021 (modified from Met-sämuuronen & Nousiainen, 2021, p. 58).

seem to have been even more successful than they would have been in the normal classroom setting—and the converse is also true. A report on the effects of COVID-19 in Finland concludes that: “[T]he emphasis on self-regulation skills creates inequality between the learners. In emergency conditions, problems with life skills, learning difficulties and the study conditions at home increase the differences between the learners” (FINEEC, 2021, p. 12). Exceptional circumstances like this highlight any existing problems in schools’ operations, such as lack of resources for providing support or the inadequate digital skills of teachers (FINEEC, 2021).

A relevant question related to equality in the post-COVID-19 world is, how can we catch up in the most effective way? No answer is given here because the measures may differ radically for individual students. Mainly, however, Nordic countries have made a remarkable digital leap in education as a result of the pandemic, which may help us solve some other challenges related to educational equality in future.

Question 6: How do technological developments challenge and offer possible solutions for educational equality

The rapidly changing technology around us may be affecting educational equality. We do not yet know the possibilities that technical and procedural advances in distance learning, the internet, social media, or artificial intelligence might offer. However, some possible trends worth following up are highlighted here.

One potential area to monitor is the technologies and procedures developed and utilized in digital pedagogy and distance learning as a response to the COVID-19 pandemic. A recent report by the Finnish National Education Evaluation Centre (FINEEC, 2021) on the effects of COVID-19 in different educational sectors outlined that, “[t]he lack of contact teaching increases the need for support, especially for learners who have more problems with the progress of their studies” (p. 12). That is, some students and teachers were neither technically nor mentally ready to make the digital leap (see also OECD, 2020a–2020e for individual country reports). On the other hand, for many students who were highly motivated and had strong support at home, distance learning provided an advantage, as discussed above. The impact of the home environment emerged as one of the key factors in the educational process and is one of the possible causes of inequality in outcomes: it is not known to what extent the required competences of citizens in a digitalized world have developed to meet the needs of education.

From the technical viewpoint, it seems evident that Nordic countries have been quite successful in taking a digital leap even before COVID-19 (see TALIS, 2018) and, for many teachers, *because of*

COVID-19 (see discussion, e.g., in Lavonen & Salmela-Aro, 2022). For example, in Denmark, even before the COVID-19 pandemic, 90% of teachers reported that they “frequently” or “always” let students use ICT for project or class work and 88% reported that they can support student learning using digital technology “quite a bit” or “a lot” (OECD, 2020e; TALIS, 2018). These percentages exceeded all other OECD countries. However, for many teachers, specifically those in home economics, sports, fine arts, music, or, in many cases, in mother language also, the COVID-19 pandemic may have been a driving force behind developing digital teaching routines.

Consequently, the digital leap may also open doors to much more advanced school shopping than before: a student interested in languages, for example, may take courses available on the opposite side of the country—even from a totally different country. This may possibly widen further the gap in achievement levels between children from advantaged and disadvantaged backgrounds. It is also possible to envision a different outcome, if the educational system can provide adequate digital skills and tools for everyone. If distance learning gains acceptance and becomes widely available in schools, there will be many opportunities for collaboration between education providers. Students in remote areas (now considered disadvantageous) would then have access to, for example, the same selection of language studies as their peers who reside in cities. Also, advances in learning theory, instructional technology, and digital learning environments may lead to more engaging and motivating learning experiences for many. For instance, there is already some evidence that digital pedagogical agents, together with digital peers, do influence learner self-efficacy, performance, and learning transfer (e.g., Makransky et al., 2019; Qu et al., 2015). In time, these developments may help educators address the issues related to individual causes of inequality, such as recognized gender differences regarding attitudes towards STEM-related school subjects.

A second trend to monitor relates to the development of artificial intelligence (AI). AI, including semi-intellectual algorithms used in main search engines, is already a part of our educational system whether we like it or not. It has become an essential part of our life: it is already learning and teaching, selecting suitable entertainment and learning content for us on the internet and in social media, and “constructing the world” of our students. At the same time, its commercial operators are able to extract large quantities of personal data and to divide the unwitting users into cultural and intellectual “bubbles” or subgroups, often to serve business purposes. Ultimately, those with internet access and the skills to utilize it to the maximum gain an advantage over those who are not interested in technology or are less motivated in seeking knowledge from the internet or benefiting from the many possibilities of AI. The use of AI in education thus raises serious ethical considerations (see, e.g., Tomasik, 2019).

The changes that are taking place in the world around us and advances in brain research raise difficult questions (see discussion in Metsämuuronen & Räsänen, 2018): What is *learning*, factually? What is *memory*? What kind of teaching is *effective*? Effective *for what*? What are the meanings of *content*, *values*, and *tradition* in teaching and learning? What will teaching and learning be like in 2030 or 2050? As a result of the advances we make, will we be able to help *all* pupils and students or will we further widen the gap between high- and low-achieving pupils and students due to the Matthew effect? What is the effect of teachers in the process? Is it likely that technologically more highly skilled teachers will persuade their pupils and students to reach much further and higher in learning and achievement in comparison with technologically less-advanced teachers, or can we rely on the researchers of learning theory and technology to find solutions for providing just the right amount of support and engagement for each learner? Even without offering answers, we may conclude that the quality of education in general, as we have in Nordic countries, will lead to changes in technological readiness in the long run, as noted by Kirikkaleli et al. (2021).

Conclusions, restrictions, and suggestions for further study

Main conclusions in a nutshell

This article discussed equity and equality from a theoretical viewpoint, as well as from the viewpoint of individual characteristics and individual choices in the post-COVID-19 world. The aim of the article was to offer a base for discussions of educational equality from the viewpoint of changes in the world causing widening disparities between the achievements of pupils and students. The essence and possibilities of educational equity and equality in the Nordic educational realm were discussed by answering six questions: (1) What kind of equity and equality are we talking about in the educational realm: numerical, proportional, formal, or moral? (2) How are the obvious paradoxes of equity, such as offering equal opportunities to all students, which allows some students to reach higher outcomes and leaves others with lower outcomes, seen in the educational realm in Nordic countries? (3) How does the modern ethos of individualism challenge educational equality? (4) How do the contemporary practices related to constructivist learning theories challenge the educational equality? (5) How has the COVID-19 pandemic affected educational equality? (6) How do technological developments challenge and offer possible solutions for educational equality?

The answer to the first question concludes that, even if we see numerical equality to some extent in practical educational settings, in most cases we expect to find proportional and formal equality on the basis of moral equity: all individuals have the moral right to equal opportunities even though they are different and unique. The answer to the second question concludes that, even if we may find common universal human values and beliefs on which it is possible to build common criteria for educational equity and equality, we cannot find absolute equality between individuals because all individuals are different and unique. The answer to the third question concludes that, while individual differences may be unavoidable, we should find political and pedagogical ways in which to handle educational inequalities. The answer to the fourth question concludes that those students who have the motivation and skills to engage in independent work gain a great deal according to modern constructive learning theory but those without are in danger of being left behind. The answer to the fifth question concludes that the COVID-19 pandemic has notably affected educational equality, at least in the short term; it has exacerbated the differences between students and weakened the possibilities of students in vulnerable situations. The answer to the sixth question concludes that new technologies, such as AI, and the wide digital leap taken by teachers and students may open, on the one hand, a potential new source of inequality and, on the other, new paths to reducing inequality.

Further discussions

More questions were raised than answered. And many important topics were not even touched upon. For example, an in-depth discussion of justice in education as an existential question may be worth studying (see UN, 2020). Specifically, these discussions may become important from the global perspective if, in coming decades, we face serious population shifts due to global warming, hostilities, and personal oppression: what are the bases of equity as a value when the watcher of a baseball game may no longer be willing to stay behind the fence (see the discussion on Figures 1a and 1b)? What could be done when they want to take the whole fence down, to liberate themselves from the burden of historical injustices? Or, from another perspective: is there a way in which we could help onlookers to become players and to set up their own games by sharing global resources more equally?

As discussed in the Introduction, we may justifiably ask, are we on the way to more serious *inequality* of possibilities because of our pedagogical decisions and technological advances? Even though this is not necessarily a reality in Nordic countries in the short run, the basic principle related to constructivist learning theories is still valid: students should be active seekers of

knowledge. But what if they are *not*? How can we make sure that they will *become* an active seeker? Who is responsible for this? If we cannot ensure this precondition of surviving the ever-more technologized society, we may be prompted to ask, are we on the brink of the *end of education, equity, and equality* as we have known them in recent decades? Obviously, we are not at the “end”. However, the latest PISA results indicate that, in Finland, “[d]ifferences in reading proficiency among students were bigger in 2018 than ever in the history of Finland’s participation in the PISA assessments” (MoEC, 2019). Two years earlier, Nordic Co-operation (2017) made the same point: “some [Nordic countries] have fallen behind in what has long been a feature of the Region: the ability of the school system to compensate for social inequality” and “the data reveals growing differences between socioeconomically disadvantaged pupils and pupils from more comfortable backgrounds” (p. 1). Analyses regarding the effects of the COVID-19 pandemic do not predict a good outcome in terms of educational equity, at least in the near future (see, e.g., Blikstad-Balas et al., 2022; Lavonen & Salmela-Aro, 2022; Metsämuuronen & Seppälä, 2022; Sjögren et al., 2021). Time will reveal the longitudinal effects of the pandemic on our societies.

All in all, it seems that, at the present time, educational systems in Nordic countries are unable to compensate for differences between students; indeed, we may see even wider gaps between them in future. We cannot go back in time to reminisce on the history of monoculture in Nordic societies. We *will* have both advantaged and disadvantaged groups amidst us. The question is: can governments, ministries of education, researchers, providers of education, educational planners, teachers, students, and parents do something about the situation? The obvious answer is: “yes, we can” (see, e.g., a meta-analysis of lessons learnt in educational policy-making in Cairney & Kippin, 2022). The most humane and sustainable solutions may still be undiscovered, and they should be actively sought for by scientists from educational, psychological, sociological, and technological fields. For instance, the use of digital technologies may open new avenues for providing an increased level of individual support that could help us to address the issue of proportional equality and enable a larger number of students to reach their full potential. If nothing else, the latest stress test of equal opportunities in Nordic societies, the COVID-19 pandemic, has provided us with valuable lessons and reminded us of the vulnerability in our societies when global catastrophes occur.

Limitations of the study

This article has four obvious limitations. First, the nature of this article is merely a literature review, or an essay, related to equity and equality rather than empirical work. Hence, from the empirical viewpoint, no new, unpublished results were presented. The focus on Nordic countries may be taken as our own contribution. As an example, pondering on how the paradoxes of educational equity and equality discussed by Metsämuuronen (2019) are seen in Nordic countries is a new contribution. Second, the empirical findings referred to concerned mainly mathematics as a school subject and Finland as a Nordic country. The reason for these restrictions is convenience: first, the sources are well-known by the authors, and, second, the equity and equality matters are discussed fully in the original studies (Metsämuuronen, 2017; Metsämuuronen & Nousiainen, 2021). Third, the literature related to the effects of the COVID-19 pandemic is notably shallow. Just the fact that the ERIC database currently includes more than 6000 publications with the keyword “COVID-19” urges systematic study of this huge amount of research. Here, only some relevant sources were referred to. Fourth, only six main viewpoints, out of many more, were discussed. Although those six may be relevant and essential ones, discussions of other root causes of educational disparity would, undoubtedly, enrich the discussion.

Suggestions for further research

Some suggestions for further research can be taken directly from the limitations of this article. The suggestions below are not given in order of importance.

First, in-depth studies and systematic reviews of the effects of the COVID-19 pandemic on educational equity and equality are needed. Specifically, the long-term effects on educational equity and equality have yet to be seen. Hence, longitudinal designs and monitoring studies are needed.

Second, the discussion of possible root causes of the obviously widening educational disparity in Nordic countries may require further pondering; the discussions around these matters are not, and should not be, closed yet. When the main sources are found, empirical studies of their real effects are needed. Conducting such empirical studies combining many distinctive, although overlapping, phenomena may be challenging. However, such ambitious studies may provide a richer picture of the complex phenomenon than simpler studies focusing on only one root cause of inequity.

Third, the restriction of this study to mathematics only, as a school subject in the empirical examples, urges the study of different school subjects from the perspective of equity. Obviously, reading and writing skills are equally important—if not more important, from the viewpoint of surviving in modern societies. However, there are already many studies into mother languages, many with the same results: girls outperform boys (e.g., OECD, 2019). Further analyses of the effect of this disparity in later life are few.

Fourth, comparable empirical studies in Nordic countries related to gender parity, population parity, and possible other varieties of disparity (see Metsämuuronen, 2019) are worth conducting. It is known that COVID-19 has had the most serious effect on students in the most vulnerable situations. Hence, studying the changes in disparity discussed by Metsämuuronen (2019), that is, as ethnic parity (widening differences between ethnic or religious groups), home language parity (widening differences between language groups), school language parity (widening differences in results based on schools' administrative and instructional language), socioeconomic status parity (widening differences in student achievement between SES groups), district parity (widening differences between districts or municipalities), region parity (widening regional differences), school type parity (widening differences between community schools and private schools), and school location parity (widening differences between rural and urban schools), may enrich our understanding of the gravity of possible inequality in Nordic societies.

Disclosure statement

No potential conflict of interest was reported by the authors.

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