The Link Between Economic Inequalities and Quality of Education: Evidence from Poland and Finland

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Abstract

In today's world this gap between the richest and the poorest is constantly widening. This paper aims to examine the impact of this economic inequality on the quality of education in two selected European countries—Poland and Finland. The choice of countries is not accidental: Finland was chosen because it has one of the best-rated education systems in the world, while Poland was chosen to indicate potential solutions, the application of which, may improve the quality of education in our country. To demonstrate that economic inequalities have a significant impact on education, rather show that it is economic inequalities, and no other factors such as political and administrative decisions, that have a significant the regional level was taken as the reference level in the analysis.

Keywords Correlation · Economy · Education · Finland · Inequality · Poland · Polarization · Schooling

Introduction

Social inequality is a construct that goes back to the beginning of civilisation. Numerous studies have shown that there is a connection between social inequalities and the quality of education—hence the idea to study and look at this connection based on two European countries. The link between variables is well studied—however, most studies focus on the impact of education on inequality. This study nevertheless shows the impact of the level of inequalities on the quality of education. The choice of these countries was not accidental—on one hand, Finland, a country with one of the best-rated education systems in the world, and on the other, Poland, a country where there are still large educational inequalities.

Meritocracy is a system in which individuals achieve social positions according to their competencies acquired through education. According to this concept, the

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main task of education is to create conditions for the comprehensive development of students (Young, 1996). Thus, a well-functioning system would occur if all citizens had equal access to schools, and social standing would be determined by qualifications earned during the educational process. In this vision, schools are supposed to bridge educational gaps based on background, race, gender, age, or economic issues. That idea underlies the way how modern education systems in many highly developed countries have been constructed.

It was assumed that the development of education would reduce the effects of social inequalities. However, considering current research (Pickett & Wilkinson, 2010), it may be quite the opposite—it is by combating social inequalities, we can contribute to improving the quality of education.

The impact of social inequalities on education has already been described by other researchers several times at national levels (Gmerek, 2011). The study was conducted at the regional level. This approach allows the opportunity to look closer at inequalities without considering the way education policy is conducted at a national level. Based on the example of regional economic inequalities and quality of education in the two European countries, an attempt was made to show the relationship between these two variables.

It is worth mentioning some demographic data, as they are important when conducting research in comparative pedagogy. These are primarily: population, its distribution, and degree of urbanisation. Both countries are comparable in terms of area—Poland covers almost 313 thousand square kilometres, and Finland a little over 338 thousand. As far as the number of inhabitants is concerned, it is diametrically different. Poland has a population of nearly 38 million, while Finland has 5.5 million inhabitants (Statistics Finland, 2018). Importantly, when planning education policy, both countries have a low birth rate. As the population density is very different in the two countries, it was decided that more information would be obtained by analysing the degree of urbanisation. Both Poland and Finland are considered highly urbanised, with the former having an urbanisation rate of about 60% and the latter close to 85%. The degree of urbanisation has been increasing at an alarming rate in Finland. Before World War II, three-quarters of the Finnish population lived in the countryside (Meditz & Solsten, 1988). Such a sudden increase in the urbanisation rate was due to the rapid development of the country in the twentieth century, associated with the relatively late mechanisation of agriculture and forestry, which pushed people from the north of the country to the south in search of work in urban centres. The effect of such dynamic changes initially saw an increase in social incoherence, but this phenomenon was managed by intensely counteracting the increase in regional disparities in Finland. Today, the most populated cities in Finland include Helsinki, Espoo, Tampere, Vantaa, Turku, and Oulu.

The situation of ethnic and national minorities in a country is also an important factor in the context of considering social and economic inequalities and equal access to education—their presence and the policies applied to them may affect social cohesion. Poland is currently an ethnically homogeneous country, although in the past the population comprised up to 30%

of minorities. Finland is also one of the least ethnically diverse 8countries in Europe, but at the same time, only 92% of the population declares Finnish as their

mother tongue. This is because Finland was a country under Swedish rule from the 13th to nineteenth century. As a result, nearly 6% of the population uses Swedish daily (Statistics Finland, 2018). Also worth noting are the Sami people, referring to themselves as Saami, who inhabit the northern part of Scandinavia. Although in historical times the Nordic countries had an assimilation policy towards them, currently in Finland the Saami can study in their language.

Economic and Educational Inequalities from a Theoretical Perspective

It was unclear to many why in developed countries, in times of affluence and the highest technological achievements, an increasing percentage of the population lives in anxiety, is prone to depression, and is insecure about themselves and their relationships with loved ones. Using data provided by economists, the answer has become available but has been repeatedly rejected for various reasons. Among other things, a study conducted in the United States by The Harwood Institute for Public Innovation showed that people felt that so-called materialism was one of the obstacles to meeting social needs (The Harwood Group, 1995).

Thus, the researchers began to examine the relationship between economic inequality in society and its condition. It turned out that there is a correlation between the level of income inequality and elements that affect the quality of society such as the level of trust, loss of relationships, mental disorders, substance abuse, life expectancy, fertility, crime rate, obesity, and the level of education (Pickett & Wilkinson, 2010). A large-scale study in 2009 found that greater inequality also negatively affects public health (Kondo et al., 2009).

These statements may seem obvious: societies with greater inequality have poorer people, who are most often affected by social pathologies. Researchers, such as Wilkinson and Pickett (2010), based on over 150 other studies, prove that social problems, including educational inequalities, more often affect people at the bottom of the social ladder. Still, in societies with more diverse incomes, these problems more often affect representatives of the middle and upper class.

Before proceeding with the analysis, it is necessary to look for an answer to the question: why inequalities in times of affluence and development of social awareness do not disappear, but continue to grow, especially those concerning income and wealth, and why the rate of growth of socioeconomic polarisation at the global level is described as "grotesque". (Lister, 2004). Therborn (2013) briefly summarises the mechanism of inequality as follows: "They [income inequality] are socially produced and sustained by systemic solutions and processes, as well as by both individual and collective distributive actions".

Distributive actions are defined as any social action, whether individual or collective, such as systemic support for or deceleration of development as well as the system of allocation and redistribution of wealth. Therborn (2013) also lists four mechanisms, which are a kind of social processes that have an impact on the effects of redistributive actions. These mechanisms can be considered about a school group,

local government units, or regions of the world economy. They include distancing, exclusion, hierarchisation, and exploitation.

In addition to the social consequences of inequality, much research focuses on its impact on economic development. A study has shown that high economic inequality slows down economic development, especially in already developed countries (Brueckner & Lederman, 2015). Moreover, it has been found that an increase in inequality leads to an increase in political conflicts, and a decrease in social capital and productivity (Persson & Tabellini, 1991). According to reports published by the OECD (Organisation for Economic Cooperation and Development), the economies of more egalitarian countries grow faster and more stable than those of countries with greater inequality (OECD, 2015). Economic disparities between countries in the region have also been found to increase terrorism (Ezcurra & Palacios, 2016). However, not all studies are critical of inequality. Empirical studies conducted in some developing countries have purported to show that social inequalities there are natural and useful, as they motivate people to act and improve their situation (Brueckner & Lederman, 2015).

It is worth pointing out that in the light of recent analyses in European countries income inequalities are deepening both in the objective and subjective dimensions. As a result, in addition to changes in values, societies are experiencing the exclusion of entire social groups. The expression of all this is the growing promotion of individuality and the cult of success (Raczkowska, 2014).

Let us, therefore, look at how inequalities precisely affect education. In every highly developed country, the importance of education is emphasised—it is beneficial both for the whole society and for each individual. It is then worth answering the question of what determines that some societies have higher levels of educational achievements than others. Many researchers (Gmerek, 2007, 2009; Dolata, 2008; Pickett & Wilkinson, 2010) stress the importance of school and the whole state's educational system. This belief is still dominant. It is also widely claimed that the key to greater economic equality in societies is the systematic improvement of education levels. However, in academic discourse, there is a growing number of views claiming that these measures are ineffective (Pickett & Wilkinson, 2010), and there are also proposals that the opposite may be true—reducing social inequality may contribute to an overall increase in the quality of education. According to experts from the Brookings Institution, a think tank from the United States, an increase in educational attainment improves the economic situation of the least privileged part of society but does not change the distribution of income across the population. These researchers claim that the best solution to improve the social status of the poorest part of society is not education, but precisely the fight against economic inequality through income redistribution of the richest part of the social ladder (Hershbein et al., 2015). Other studies claim that it is the family environment and socio-economic status that have the greatest impact on a student's educational achievements (Pickett & Wilkinson, 2010). Benn and Miller (2006) argue, in a report on the future of education in the UK, that the gap between rich and poor children, and the resulting differences in the quality of the home environment, is one of the biggest problems in modern education. Students, therefore, do better if their parents have higher incomes and are themselves better educated. The equipment of the home is

also important: access to encyclopaedias, dictionaries, newspapers, and computers (Pickett & Wilkinson, 2010). Most important, however, is the parents' commitment to their children's education. This gap between the best and the worst affects many aspects of education, which will be described below.

According to Pickett and Wilkinson, it is primarily income inequality that affects educational achievements. This applies both to educational results, as well as, as shown by research conducted in the United States, to dropping out of school before entering the matriculation exam. On the surface, it may seem that the explanation is simple—in American states with greater inequality, the poorest young people are forced to drop out of school to work and contribute to the household budget. However, in their analysis, researchers have shown that poverty does not fully explain this phenomenon (Pickett & Wilkinson, 2010).

The income achievement gap between the best and the worst off was studied by Willms (1999). He tested the reading and writing skills of young adult citizens of several developed countries and compared the results to the level of education of their parents, which led to two conclusions. The first was that parental education does indeed have a significant impact on children's educational attainment. The second conclusion, however, is not so obvious—the author noticed that in countries with greater economic equality, the results were relatively better regardless of the parent's education. Thus, it can be concluded that in addition to parents' education and social status, it is the level of inequality that matters for an individual's educational attainment.

The role of socioeconomic status in producing and reproducing educational inequality has been described within sociological scientific theories—two of the most important are briefly described below.

The first of those grew out of the disillusionment of a growing segment of society with the implementation of human capital theory and meritocracy. According to theorists and proponents.

of a meritocratic society, an individual's success and social standing should be strictly dependent on his or her certified educational attainment, and the role of education is to provide individuals with an equal opportunity to earn the coveted diploma. This idea negating previous ways of determining elites, such as nepotism, oligarchy, or nationalism, seemed right and just. A criticism of this way of looking at education was the concept of a credential society. Collins and Dore are considered the fathers of this concept (Gmerek, 2011).

In this concept, the major role of the educational system is to provide society with a sufficient number of diplomas of adequate quality. At the same time, the educational system, instead of bridging, as meritocracy assumed, reproduces socioeconomic inequalities through the disproportionate availability of degrees to people from different social groups. The educational and economic system meets the expectations of society and "produces" more and more diplomas for more and more students. As a result, inflation of diplomas is taking place, which means that not only the quality of the diploma is important, but also the quality of the university from which it was earned. This situation benefits the upper and middle classes, which can provide their children with private education, tutors or special classes preparing them for entrance exams or external exams. What matters to parents is to provide the

best possible conditions for their child, not "competition". Gmerek's (2011, p. 99) approach to the perception of a diploma is summarised thus: "The acquisition of a relevant diploma is often synonymous with an almost automatic attainment of a high social and professional position".

According to Brown (2001), one of the theorists of the credential society concept, contemporary educational systems and the associated cult and inflation of the significance of diplomas ultimately reinforce the differentiation of educational opportunities. This system favours individuals whose families have the money and connections to obtain an education that guarantees social success.

The second, much more momentous, sociological concept is the theory of economic reproduction by Bowles and Gintis (1976). A complex critique of the U.S. educational system, this theory describes the relationship between education and economics, and their effect on reproducing socioeconomic inequality. The theory of economic reproduction posits that schools support the functioning of the capitalist labour market, and they do so by replicating the status of individuals in society. As Gmerek (2008, p. 37) summarises: "Reproduction thus involves the transmission of intergenerational (primarily economic) status from parents to children".

This theory grew out of neo-Marxist thought and openly questions the meritocratic way of thinking about education prevailing in the 1970s in the United States. Moreover, the authors point out that the meritocratic system and the ideology associated with it is merely an illusion designed to hide the truth about the real, as they see it, the role of the educational system. To legitimise the theory authors assumed that the economic system dominates the rest of the social structure. Moreover, schools, like businesses, use a system of punishment and rewards (in the form of grades), by which they deprive students of the opportunity to control the course of their education (Bowles & Gintis 1976). According to economic reproduction theorists, the relationship between student and teacher is a mirror image of the relationship in later professional life. Therefore, according to the authors of the theory, lower levels of education are characterised by strong control, because they prepare for work under constant control. Higher levels of education, such as high school or higher education, allow students to develop independently and prepare them for managerial positions that require the ability to make independent decisions (Gmerek, 2011). Also relevant to this theory is the assumption that schools for lower-class children have, as Gmerek (2008) lists, weaker funding, poorer facilities, larger class sizes, weaker and lower-paid teachers, and there is a greater emphasis on student discipline within the schools themselves. This means that despite the claimed equality of opportunity, economic reasons mean that children from richer families will outperform their peers from poorer families.

The theory of economic reproduction is one of the most important theories in the sociology of education. Since its publication in 1976, a public debate has begun that has influenced the development of radical thinking about education. It is worth noting the most important objections to the theory of economic reproduction. As pointed out by Gmerek (2008), this theory can be accused of a lack of possibility to create the world by people—in Bowles and Gintis's theory, man is shaped solely by external factors, to which he unreflectively submits. It is also referred to by Willis (1981), who notes that the theorists did not consider the fact that the ideology

transmitted by schools may be differently received by students depending on their previous experiences. The dominance of the economic system over the other elements that make up society has also been questioned.

To conclude the discussion of theories and research on the relationship between economic and educational inequalities, it is worth explaining why mainly the arguments of the supporters of the welfare state are cited. This is because the interest of the other political options in these issues is negligible, and the existing order is not recognised as a problem. For a wide part of the public, the last, permanently established, theory is the theory of meritocratic society, which was briefly described in an earlier part of the article.

Methods and Data

In this study, to verify the hypotheses and find answers to the research questions, from the wide range of scientific methods used in socio-economic geography, Spearman's rank correlation test was chosen as the statistical method. This test has often been underestimated in geographic works (Runge, 2007).

The statistical test was conducted on data mostly referring to the year 2010. However, due to access to information, some of the measures used to create the synthetic education quality index were from 2011. The statistical analysis was based on data from 2010, for three main reasons: it is the year before another administrative reform in Finland, which took place in 2011, it is also the period before the education reform in Poland initiated in 2016, during the search for statistical data it was not possible to find data describing economic inequality in Poland at the regional level for the later period (after 2010).

Present-day economic inequality is a deeply researched phenomenon. Both unequal distribution of wealth and income inequality are being analysed. Typically, inequality is studied at the national level, although regional studies are also becoming more common. Many different measurement methods are used to describe economic inequality. They are all quite similar to each other, and the rankings of countries created by them are generally very close to one another. One of the more complex measures of economic inequality is the Gini index. It measures inequality as a cross-section of society, rather than looking only at the extremes like the others. It is simple to read—if all income went to one person the index would be one or one hundred (depending on the notation used), while at maximum equality if everyone received the same amount, the index would be zero. The lower the value of this index, the greater the equality in society. Income inequality can be also measured by the so-called Robin Hood index, which tells us what proportion of income should be taken from the rich and given to the poor to achieve complete equality (Pickett & Wilkinson, 2010). Undoubtedly, the simplest measure is, also used by official institutions, the ratio of the incomes of the richest 20 per cent of the population to the poorest 20 per cent, or a very similar ratio of the extreme 10 per cent.

The research was conducted at the regional level. Therefore, it was necessary to obtain data at this reference level. The basic spatial units for which statistical data is collected are the Polish voivodships and the Finnish *maakuntas*. There is

some discrepancy here because, from the point of view of NUTS, that is Classification of Territorial Units for Statistics proposed by the European Statistical Office, these are different levels—voivodships are NUTS 2 and *maakuntas*—NUTS 3—in both countries these are the highest units of territorial self-government. This definition of a region is justified because when analysing economic inequality and the quality of education, it is important to pay attention to the actions of the authorities that create national and regional policies. The analysis will therefore be carried out for 34 units—16 from Poland and 18 from Finland.

For the sake of accuracy, there are 19 regions in Finland, but due to the specificity and availability of data one of them is not analysed. Åland Islands is a region located in the Baltic Sea at the mouth of the Gulf of Bothnia. It is a Swedish-speaking area with a high degree of autonomy, and the available data does not appear to be fully representative.

The measure that has been obtained is the previously mentioned Gini coefficient. Unfortunately, since most international institutions collect data on inequality only at the national level (e.g.: OECD, World Bank) or at the lowest NUTS2 level (Eurostat), it was decided to use regional data made accessible by others.

In Finland, the National Statistical Office, Tilastokeskus, provides data on income inequality at both national and sub-regional levels. Since the differences in population between individual *seutukunta* within a region were not very large, an average was drawn to calculate the Gini coefficient values.

Data for Poland is provided by the Central Statistical Office, but only at the national level. Several regional studies have been carried out (Jedrzejczak, 2015; Mowczan, 2015), in which data for provinces was calculated based on partial data made available to researchers upon special request. In this study, it was decided to use the data compiled by Mowczan, for several reasons. Most importantly, it was compiled not only for 2010 but for all years in the period 2000–2010, which allowed for a more reasonable analysis.

In presenting the quality of education at the regional level in both countries it was decided to calculate a synthetic indicator of education quality. Measures from the three subject areas used in comparative pedagogy research were used, that is, educational accessibility, educational process, and educational outcomes. In addition, two indicators were selected from each category to illustrate as fully as possible a given fragment of educational reality through statistical data. Also for this purpose, the author has always tried to select from each research scope measure relating to other educational levels of ISCED 1997. After such selection, the final choice of measures was influenced by pragmatic concerns such as access to data and time and territorial scope.

Of the indicators describing the accessibility of education, the following were selected: the percentage of the population in education (ISCED 1-6) and the percentage of students in special or remedial education. The high value of the first indicator means the universality of education, the important role of education in social life, and the manner and amount of education financing. A high value of the second indicator, paradoxically, also indicates a high level of access to education. Many researchers agree—that the higher the percentage of students

receiving special or remedial education, the better the overall quality of education (Kivirauma & Ruoho, 2007).

The average number of students per classroom unit (ISCED 1 and 2) and the average number of students per teacher in upper secondary schools are two selected indicators of the educational process. Research in the United States has shown that class size affects, among other things, test and examination scores and students' social capital (Schanzenbach, 2014). A similar relationship is presented by the second selected measure—the average number of students per teacher in upper secondary general education (ISCED 3). The smaller this value is—the more attention a teacher can dedicate to individual work with a student.

To describe the results of the educational process using statistical methods, the following two measures were selected: the percentage of the population with higher education and early school leavers, i.e., in the case of this analysis, the percentage of 20–24 year-olds who have not completed a school level higher than lower secondary school—in Poland these are gymnasiums, and in Finland—extended schools.

The arguments proving that education is even crucial for individuals and society were quoted earlier. At the same time, it is worth noting the dangerous and increasingly common phenomenon of over-education in society, which results in work below qualifications and a growing percentage of people choosing vocational and technical fields of study (Gmerek, 2011). Many factors may influence the rate of early school leavers, including economic and socio-cultural factors affecting life aspirations, as well as the weakness of the education system and the inability to keep such young people in the education process. A high indicator means a very bad condition of education and has a negative impact, for example, on the economy, including the difficulty of finding qualified employees.

The final version of the synthetic indicator of education did not include data showing the results of PISA studies (Programme for International Student Assessment). These are comprehensive surveys that test the skills of 15-year-olds in OECD countries in three categories: mathematical skills, reasoning in science, and reading and interpreting text (OECD: PISA, 2018). Thus, it is potentially an excellent measure to describe the level of educational outcomes. However, this data is compiled at the national level. It is possible to obtain microdata and independently calculate data for each of the regions analysed, but during the research stage it was discovered that the selection of schools in Poland is uneven, so results from individual regions could be misleading.

Findings

The obtained data on economic inequality is as follows: Gini coefficient, as of 2010, takes values of 26.8 for Finland and 32.1 for Poland. Even though at the national level the difference does not seem to be significant, between regions within a country, as well as comparing individual regions to each other, economic inequality in Poland is higher.

Based on the data shown on the map (Fig. 1), we can see that inequality in Finnish regions is generally lower than in individual provinces in Poland. This is in line
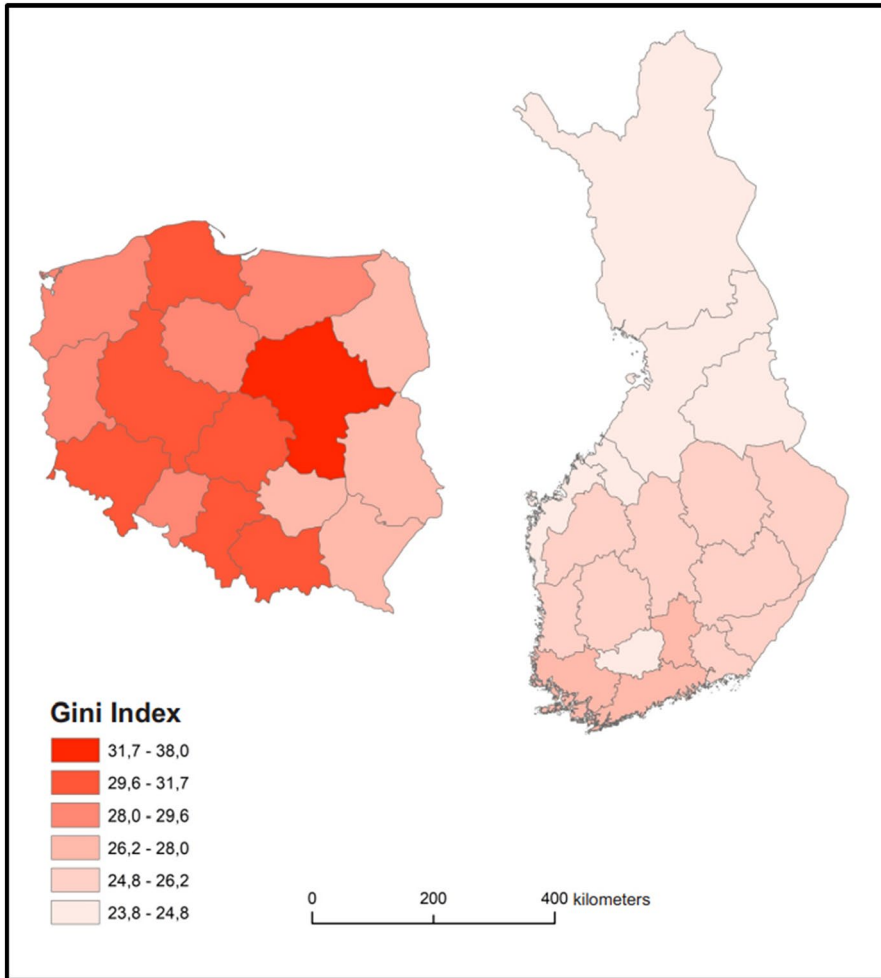
Fig. 1 Map of gini index across Poland and Finland

with the previously cited data on economic inequality for entire countries—according to the United Nations, the Gini coefficient is 26.8 for Finland and 32.1 for Poland, respectively. This is true for most regions—except for the Uusimaa region, which includes Helsinki, and the Åland Islands region, which was excluded from the analysis. The least income-diverse region of Finland is Central Ostrobothnia, located on the Baltic Sea in the central part of the country. In Poland, the province with the highest inequality also turned out to be the region where the capital of the country is located—the Mazowieckie voivodship. There is a certain dependence which is also visible in other countries –

in many cases, large urban centres are more developed and therefore richer than the surrounding peripheries. The regions with the smallest inequalities in Poland are

Podlaskie and Lubelskie voivodships. It is also worth noting the spread of the Gini coefficient. Overall, in the studied regions the least was 23.6 in Central Ostrobothnia, and the most was 38.0 in Mazowieckie voivodship. However, the values in Finland ranged from 23.6 to 27.3, and in Poland between 26.8 and 38.0, which reflects the income disparity across the countries.

These results are broadly consistent with the actions taken by the analysed countries. Finland has been continuously aiming, since the middle of the twentieth century, to develop each part of the country equally. This process can be seen in the investment sector and the implementation of ambitious social policies. Poland is also characterised by a high level of income redistribution, similar to Canada, Germany, or Finland, however, Polish social policy is usually assessed negatively, if only due to low financing. This difference between the data collected by the Organisation for Economic Cooperation and Development and the opinions of Poles is due to the large subsidies to state pensions from the state budget, which is commonly not considered a part.

of social policy, but only a return for previously earned money—in 2013 the subsidy from the country's budget to the Social Insurance Institution (ZUS) amounted to 49 million PLN, and the Agricultural Social Insurance Fund (KRUS) another 15.9 million (Leszczyński, 2015).

Finland was and remains an egalitarian country, but does Poland also belong to this type of country? Leszczynski claims that, in principle, Poland has always been a country with high social inequalities. He refers, among others, to the poverty of the Polish countryside compared to the wealth of the magnates, described by foreign observers as early as the seventeenth century. Inequalities were also observed among the nobility. According to British travellers, the poverty of the Polish countryside exceeded that of 19th-century workers described by Engels. In the opinion of Leszczynski (2015), Poland's political and economic dependence on the Soviet Union after World War II led to new planes of inequality. The agrarian reform and nationalisation of the economy completed in 1949 influenced the reduction of wealth differences among the population, but at the same time, the Polish real socialism authorities led to an increase in inequality in access to wealth and power. Interestingly, if official statistics are to be believed, in the 1970s income inequality was greater than in Scandinavian countries or the Federal Republic of Germany. However, contemporary researchers (Jarosz & Kozak, 2015, p. 7), openly state about inequality: "Poland of the twenty-first century is a country of growing inequality. Material, social, educational, political or ethnical". When describing inequalities in Poland, the regional aspect is also important, as large inter-regional, as well as intra-regional variations, are observed. Therefore, it is difficult to speak of Poland as an equal country throughout its history.

As far as the quality of education is concerned, a synthetic indicator for the quality of education was created based on a total of six indicators in three categories. As a reminder, these are the percentage of the population in the process of education (ISCED 1-6), the percentage of students in special or remedial education, the average number of students in a classroom unit (ISCED 1 and 2), the average number of students per teacher in upper secondary education, the percentage of the population with higher education, and the percentage of 20 to 24 year-olds who have not

completed upper secondary education. As the measures used were all of the different measures, some proportional and some inversely proportional, the indicators were aggregated using two different formulas.

$$aggregated\ x = \frac{x-a}{x-b}\ or\ 1 - \frac{x-a}{x-b}$$

a − the lowest observed value of the variable x

b − the highest observed value of variable x

The first formula was used to aggregate measures such as the percentage of students in special education, the percentage of the population in the educational process, and the percentage of the population with a college degree. The second formula was used to aggregate inverse measures such as the average number of students per teacher in secondary education, the average number of students in a class unit, and early school leavers, which is the percentage of 20–24 year-olds who are out of secondary education. Using this method of data aggregation, each of the sub-measures of the synthetic index was given a value from 0 to 1. A similar method of aggregation is used in the calculation of the Human Development Index, HDI.

Thus, among the 34 regions studied, the synthetic index of education quality reached values ranging from 0.235 in the Warmian-Masurian province to 0.782 in the Finnish Ostrobothnia. As can be seen from the earlier analysis, most of the Finnish regions have better results than the Polish provinces. The exceptions are the regions of Satakunta, which has a lower value of the indicator than the Mazowieckie voivodship, and Päijät-Häme, which still had a lower value of the indicator than 8 Polish voivodships. The Mazowieckie voivodeship had the highest value among Polish regions, which is related to the wealth and prestige of this region, and the Lubelskie and Podkarpackie voivodeships. The results for individual regions are presented on the map (Fig. 2).

The table (Table 1) attached below presents both the statistical data and the aggregate value calculated for each component, which was used to calculate the synthetic index. To better understand the high values of the synthetic measure for Finland, regional results for each component are discussed in the following paragraphs. The statistical description is enriched with a qualitative one.

Researchers agree that the great strength of Finnish education is its effective prevention of educational inequality (Gmerek, 2007). An undoubted example of this is the high percentage of students enrolled in special education. It is also worth noting that this type of education looks different in Poland, where most children and young people with intellectual and physical deficits attend separate institutions dedicated to them. In Finland, students with special educational needs usually attend lessons together with all children and only receive additional support in the form of remedial teaching, extra lessons, or the help of an assistant, such as a translator, who helps the student to master the material (Vipunen, 2018). This approach allows students in special education to quickly correct deficiencies and return to regular education. Not without importance is also, the sense of community within the group and society.
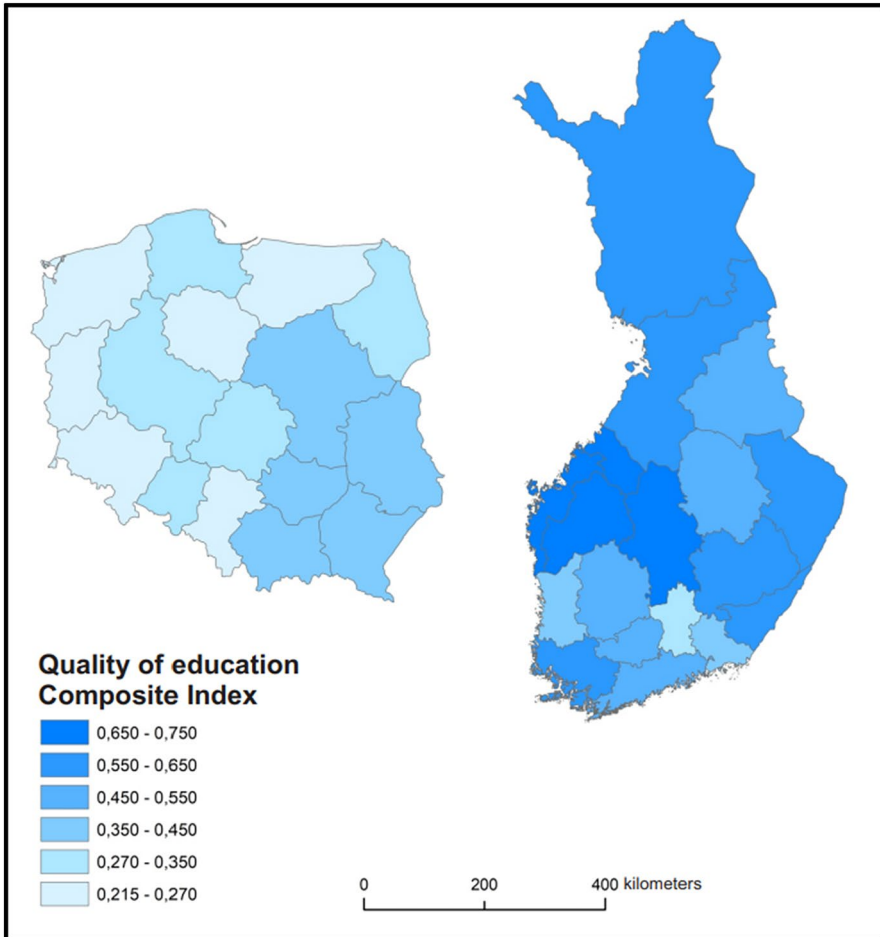
Fig. 2 Map of composite index of quality of education

Finland also leads in the percentage of the population enrolled in educational institutions. It is influenced by many factors—even though the period of compulsory education is shorter than in Poland, Finns devote a longer part of their lives to education (Gmerek, 2007), experts also emphasise the demographic issues (such as population ageing) and society's attitude to the concept of lifelong learning. One should not forget about education expenses and public interest in education issues. However, Finland's advantage here is not as big as in the previous indicator. Note that in addition to the highest score, the lowest one also belongs to one of the Finnish regions.

The next two measures, the average number of pupils per teacher and the average number of pupils per class unit are similar, although, of course, they refer to different educational stages. Here, too, Finland has better results, but the difference is not significant. It is most likely due to the regulations on the number of pupils in

Table 1 Data used to create the composite index of quality of education

Region	Composite index of quality of education	Percentage of students in special education		Percentage of population in education process (ISCED 1–6)		Average number of students per teacher in general upper secondary schools (ISCED 3)		Average number of pupils per class unit (ISCED 1+2)		Early school leavers		Percentage of population with tertiary education	
Southwest Finland	0,610	12,7	0,889	26,099	0,760	13,2	0,654	19,2	0,333	17,1	0,379	27,3	0,647
Central Finland	0,651	11,2	0,770	28,189	0,877	11,4	0,852	19,1	0,359	15,9	0,452	26,2	0,596
Kainuu	0,543	9,8	0,660	13,396	0,045	10,9	0,907	17,2	0,846	16,4	0,424	21,5	0,377
Kanta-Häme	0,451	9,4	0,628	23,653	0,622	14,2	0,548	19,6	0,231	21,5	0,112	25,5	0,564
South Karelia	0,612	11,8	0,818	23,076	0,590	11,1	0,888	18,1	0,615	18,5	0,294	23,4	0,466
North Karelia	0,628	12,5	0,873	26,946	0,807	12,1	0,773	19,2	0,333	14,0	0,570	22,3	0,413
Kymenlaakso	0,449	14,1	1,000	20,172	0,426	14,8	0,484	19,2	0,333	23,2	0,005	23,0	0,447
Lapland	0,634	9,7	0,652	27,185	0,821	11,2	0,872	17,5	0,769	19,2	0,255	22,8	0,437
Ostrobothnia	0,746	11,9	0,826	28,098	0,872	12,3	0,755	16,6	1,000	16,6	0,413	26,6	0,613
South Ostrobothnia	0,702	9,6	0,644	25,748	0,740	10,1	1,000	17,1	0,872	14,3	0,550	22,1	0,404
North Ostrobothnia	0,618	9,9	0,667	30,372	1,000	12,8	0,701	19,2	0,333	16,6	0,409	26,2	0,596
Central Ostrobothnia	0,666	8,4	0,549	27,885	0,860	11,5	0,845	17,2	0,846	15,2	0,495	22,0	0,401
Päijät-Häme	0,329	13,3	0,937	12,587	0,000	15,2	0,437	20,2	0,077	22,7	0,040	23,8	0,481
Pirkanmaa	0,522	10,0	0,675	27,034	0,812	15,0	0,463	20,2	0,077	16,8	0,402	28,5	0,702
Satakunta	0,430	10,4	0,707	12,688	0,006	12,4	0,742	18,8	0,436	19,3	0,246	22,9	0,443
South Savo	0,556	11,2	0,770	22,928	0,581	13,2	0,658	18,2	0,590	17,9	0,330	22,1	0,404
North Savo	0,490	11,0	0,755	14,797	0,124	12,7	0,710	18,8	0,436	16,6	0,409	24,3	0,507
Uusimaa	0,474	12,6	0,881	27,063	0,814	17,8	0,150	20,5	0,000	23,3	0,000	34,8	1,000
Lower Silesia	0,270	1,8	0,027	18,752	0,347	17,6	0,175	20,0	0,136	10,8	0,768	17,0	0,164
Kuyavia-Pomerania	0,264	4,1	0,210	18,983	0,360	18,2	0,109	19,6	0,244	12,5	0,664	13,5	0,000

Table 1 (continued)

Region	Composite index of quality of education	Percentage of students in special education		Percentage of population in education process (ISCED 1–6)		Average number of students per teacher in general upper secondary schools (ISCED 3)		Average number of pupils per class unit (ISCED 1+2)		Early school leavers		Percentage of population with tertiary education	
Lublin	0,405	1,7	0,017	19,717	0,401	16,0	0,350	18,0	0,645	9,3	0,859	16,8	0,155
Lubusz	0,245	2,1	0,049	16,795	0,237	18,4	0,082	18,9	0,403	12,9	0,637	14,9	0,066
Łódź	0,298	1,5	0,000	18,130	0,312	16,7	0,267	19,4	0,287	10,8	0,767	16,8	0,155
Lesser Poland	0,393	2,1	0,051	21,241	0,487	17,3	0,205	18,9	0,421	7,0	1,000	17,6	0,192
Masovia	0,424	1,9	0,037	19,914	0,412	16,3	0,313	19,1	0,366	9,4	0,857	25,4	0,558
Opole	0,346	2,2	0,059	17,194	0,259	16,2	0,330	18,3	0,559	9,8	0,829	14,3	0,038
Subcarpathia	0,394	1,8	0,022	18,829	0,351	17,4	0,196	17,7	0,727	7,6	0,962	15,8	0,108
Podlaskie	0,327	2,4	0,074	19,363	0,381	17,4	0,189	19,2	0,326	10,0	0,818	17,2	0,174
Pomerania	0,291	2,7	0,095	19,681	0,399	17,6	0,168	20,0	0,126	11,2	0,741	18,1	0,216
Silesia	0,245	2,0	0,043	17,386	0,270	18,1	0,116	20,2	0,086	10,7	0,777	17,3	0,178
Holy Cross	0,369	2,0	0,045	18,059	0,308	16,6	0,284	18,3	0,564	9,2	0,865	16,6	0,145
Warmia–Masuria	0,215	2,5	0,079	18,673	0,342	19,2	0,000	19,4	0,271	15,1	0,502	15,6	0,099
Greater Poland	0,307	2,1	0,050	19,799	0,406	18,1	0,121	19,4	0,282	9,5	0,848	16,4	0,136
West Pomerania	0,263	2,7	0,097	18,000	0,304	17,8	0,145	19,3	0,313	14,2	0,562	16,8	0,155

a class and better and more effective implementation of them. However, it is worth noting that according to a study conducted in Poland by the Institute of Educational Research, class size does not translate into educational results, but at the same time the number of children translates into the climate in the classroom, as well as the time the teacher must spend on organisational issues. On this basis, it was also considered reasonable to lift these limits in Poland. In the case of the average number of pupils in a class unit, again the extreme values fell in the Finnish regions: statistically, the smallest classes are found in the Ostrobothnia region and the largest in Uusimaa.

There is one indicator by which the Polish voivodships fared much better than their Finnish counterparts. This measure is the percentage of people aged 20–24 with education not higher than that associated with completing lower secondary school in Poland or extended school in Finland. It should be noted, however, that the way this variable was calculated differed from the way used by Eurostat when calculating Early school leavers. In addition to a slight adjustment of the age range, the experts from the European Union agency also considered people who did not have higher education but continued their education. Therefore, due to the lack of regional data of this type, the indicator calculated for this analysis only took formal education into account, and not further participation (or not) in the educational process. Also, note that compulsory education in Finland is shorter and ends at a lower secondary level, so further participation in the educational process is optional for Finns.

The last indicator is the percentage of the population with higher education. Not surprisingly, Finland performs better here than Poland, although it is worth noting the high position of the Mazowieckie voivodship. This is most likely related to the metropolitan effect in this region. It is also worth noting that too high a percentage of society with a university diploma may lead to its devaluation and the education of society. Finally, when evaluating the quality of education in different regions based on the above variables, Finland comes out much better than Poland. It is influenced by their solutions in education management, as well as innovative approaches to education. Some of the most important factors, such as financing or management, have been described in earlier sections, but it is also worth noting other strengths of Finnish education. These include the large role of the student in the educational process, the high status of schools and teachers in society, and the partial abandonment of compulsory homework.

Therefore, the question remains whether the fact that the quality of education is lower in Poland and economic inequality is higher in Finland and vice versa is due to the cause-effect relationship or indicates a random co-occurrence of these two variables. According to the researchers cited earlier, there is a strong relationship between inequality and education.

To properly prepare the data for the calculation of Spearman's rank correlation coefficient, it was necessary to first rank the variable X, i.e., the value of the Gini coefficient for each region, from smallest to largest, and then to assign ranks from 1 to 34, since that is the size of the sample. As the value of variable X was repeated twice as recommended by Norcliffe (1977), a correction was applied and the same averaged rank was given to both observations. The

next step was to assign ranks to the Y variable, which is the value of the synthetic coefficient of educational quality for subsequent observations. The next column contains *d*, which denotes the difference between the two-rank series. In the formula for Spearman's rank correlation coefficient, these differences must be raised to the power of two, as shown in the next column, and then the sum of all the powers thus obtained must be calculated. The entire dataset is presented in table (Table 2).

Once we have all the data we need, the total should be substituted into the formula below.

$$r_s = 1 - 6 \sum_1 d_i^2 / N^3 - N$$

d − difference of two rank series

N − number of observations

Therefore:

$$r_s = 1 - \frac{6 \times 11777}{34^3 - 34} = 1 - \frac{70662}{39270} = -0,798$$

$$r_s = -0,798$$

To understand what it means that the Spearman rank correlation coefficient was close to − 0.8, it is necessary to recall what values this measure can take and what they mean. First, this coefficient takes values ranging from + 1 to − 1. The first value indicates a perfect positive correlation and the second indicates a perfect negative correlation. If the coefficient was the middle value, zero, it would mean that the variables are entirely uncorrelated (Norcliffe, 1977). Typically, both negative and positive correlations are considered weak up to a value of 0.5, while correlations above this value are considered strong. In the social sciences, however, correlations above 0.3 are considered strong and significant. This means that the Spearman rank correlation coefficient, which was close to − 0.8, indicates a very strong relationship between the variables: the Gini coefficient, which determines economic inequality, and the synthetic indicator of the quality of education.

However, such a strong relationship does not necessarily indicate interdependence between two variables. Therefore, to prove that there was not only a co-occurrence but also a correlation between economic inequality and quality of education, a two-pronged approach was decided upon. A statistical test was conducted above, but the nature of the relationship between the variables has already been described in the previous part of the article. It is the arguments cited earlier that support the result of the statistical test, which showed such a strong negative correlation.

To sum up, the result of the statistical test shows a high correlation between the variables, if one has in mind the quantitative and qualitative data presented in the previous chapter, it seems to be a logical consequence of the educational policy pursued by each of the states. Already knowing the Spearman statistical correlation

Table 2 Data used in Spearman's correlation

Region	Gini index (X)	Composite index of quality of education (Y)	Rank x	Rank y	d	d^2
Southwest Finland	26,7	0,610	17	26	− 9	81
Central Finland	25,4	0,651	10	31	− 21	441
Kainuu	23,8	0,543	2	24	− 22	484
Kanta-Häme	24,7	0,451	5	20	− 15	225
South Karelia	25,5	0,612	11	27	− 16	256
North Karelia	25,6	0,628	12,5	29	− 16,5	272,3
Kymenlaakso	25,1	0,449	7,5	19	− 11,5	132,3
Lapland	24,2	0,634	3	30	− 27	729
Ostrobothnia	24,8	0,746	6	34	− 28	784
South Ostrobothnia	25,1	0,702	7,5	33	− 25,5	650,3
North Ostrobothnia	24,3	0,618	4	28	− 24	576
Central Ostrobothnia	23,6	0,666	1	32	− 31	961
Päijät-Häme	26,6	0,329	16	11	5	25
Pirkanmaa	25,6	0,522	12,5	23	− 10,5	110,3
Satakunta	26,2	0,430	15	18	− 3	9
South Savo	25,9	0,556	14	25	− 11	121
North Savo	25,2	0,490	9	22	− 13	169
Uusimaa	27,3	0,474	20	21	− 1	1
Lower Silesia	31,7	0,270	33	6	27	729
Kuyavia-Pomerania	29,3	0,264	26	5	21	441
Lublin	27,2	0,405	19	16	3	9
Lubusz	28,8	0,245	24	3	21	441
Łódź	31,2	0,298	32	8	24	576
Lesser Poland	30,5	0,393	30	14	16	256
Masovia	38,0	0,424	34	17	17	289
Opole	29,6	0,346	27	12	15	225
Subcarpathia	27,7	0,394	21	15	6	36
Podlaskie	26,8	0,327	18	10	8	64
Pomerania	31,0	0,291	31	7	24	576
Silesia	30,4	0,245	29	2	27	729
Holy Cross	28,0	0,369	22	13	9	81
Warmia-Masuria	29,0	0,215	25	1	24	576
Greater Poland	30,3	0,307	28	9	19	361
West Pomerania	28,7	0,263	23	4	19	361

result, which was close to -0.8, and analysing it, keeping in mind the other studies and theories described in the paper, it is reasonable to claim that it is economic inequality and the resulting social divisions that affect the quality of education.

Discussion

Analysing the literature on the subject and conducting statistical analysis made it possible to show a correlation between economic inequality and the quality of education. Such a strong correlation and the described causal connection undoubtedly confirm that inequality affects the quality of education. Moreover, many state education systems are geared toward further reproduction of inequality rather than real levelling of opportunities, which was originally intended to universalise education in the spirit of meritocracy.

It is worth noting that the COVID-19 pandemic revealed the illusory egalitarianism of much of European societies. The full picture of the social impact of the pandemic remains to be seen, but it is already apparent that inequalities, especially economic ones, were on the rise at the time. Moreover, successive restrictions and lockdowns have contributed to a deepening of educational inequalities. Of course, the full extent of this phenomenon is not yet known, but it is already clear that coronavirus has hit the poorest the hardest. In future research on the impact of inequality on the condition of society, it would be worthwhile to consider the impact of the pandemic—both in terms of increasing economic inequality and the deterioration of the general condition of society.

However, in addition to studying the phenomenon of social and economic inequalities and the dimension of their consequences, it is also necessary to consider how to counteract disparities. Very often the answers given can sound evasive. This is because many researchers avoid topics that seemingly may have political or ideological overtones. For many more, this may resemble a Donkichottian windmill fight, but it is important to remember, quoting Therborn (2013), that: "Inequalities are social constructions and as such amenable to deconstruction".

To do so, one must identify the forces that favour and disfavour social equality. The latter primarily include, in the modern world, economic liberalism and right-wing authoritarianism (Therborn, 2013). One region of the world where these phenomena have been successfully combated is Latin America, where the majority of countries have defied the global trend of rising national income inequality.

When it comes to forces for equality, looking from a historical perspective, these certainly include the working class, which has been one of the most important drivers of the struggle for democracy, electoral and social rights, and economic redistribution (Therborn, 2013). Today, the working class is practically gone, but organisations with similar ideals and goals—trade unions—are emerging. Their strength is evident in the fact that in the European Union, as many as 70 per cent of workers' wages are regulated by collective agreements (Pickett & Wilkinson, 2010). A second group fighting against inequality is the so-called identity movements (Therborn, 2013). These include women's groups, ethnic groups, and LGBT+communities. Their actions usually only affect them directly, but they undoubtedly contribute to promoting ideals of economic and existential equality. The third multi-stakeholder group fostering equal opportunities in developed countries are all consumer movements whose members are guided by an ethical compass in their daily choices. They also often engage in social or

environmental initiatives. The fourth force, causal in principle, is political will. In recent history, an excellent example can be found in the highly developed countries of East Asia, where dynamic economic development in the twentieth century was combined with growing social equality (Pickett & Wilkinson, 2010).

Thus, systemic solutions are indeed numerous. They include, among others: sealing loopholes in the tax system, raising tax rates, or linking the maximum wage in a company to the minimum or average wage. However, these solutions have the disadvantage that they may not be accepted by businesses. Therefore, alternative solutions are being used. These include, for example, the ideas proposed by Gar Alperovitz, who suggests, among other things, further development of the non-profit sector. In the United States, two thousand municipal energy companies operate in this way, supplying energy to nearly 40 million people. It is also worth noting that many of the largest local employers are non-profit companies—including educational and medical institutions.

Some forms of such solutions are cooperatives of different natures, where employees are shareholders in the company, so the company's eventual success is shared among the employees. In developed countries, including Finland, the idea of employee shareholding, which operates on similar principles as cooperatives, is becoming increasingly popular.

In conclusion, it should be emphasised that the struggle for an equal society is not an idle and ineffective fight. It is worth trying to reduce income inequalities, as this directly translates into a better condition of society, and thus the quality of education. It should be remembered that the differences with which students are included in the educational process can be bridged or deepened. Thus, on one hand, we have the social capital that children have brought from their homes, and on the other, the educational system, which can be structured in such a way that students with lower results are "pulled up" or assigned to separate classes. Researchers Benn and Miller wrote about the realities of British education: "One of the biggest problems facing British schools is the gap between rich and poor, and the enormous disparity in children's home backgrounds and the social and cultural capital they bring to the educational table".

Of course, the topic of the links between economic and educational inequality is not exhausted in this article. It would be worthwhile to enrich it with an analysis from a dynamic perspective—both in terms of factors influencing changes in the dimension of economic inequality and the impact of these changes on the quality of education. Another direction worth considering would be to extend the analysis with empirical studies conducted in selected regions.

of Quality of Education for Poland is from databases of Statistics Poland (Główny Urząd Statystyczny). Required data on the regional level was taken from Local Bank Data. Those are available via: https://bdl. stat.gov.pl/BDL/start

Declarations

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