

EDUCATION, SOCIO-ECONOMIC DEVELOPMENT AND HUMAN CAPITAL: CROSS-COUNTRY ANALYSIS

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ABSTRACT

The article considers different approaches to assessing human capital development. The authors explore challenges in methodology and the indices of human capital development in the increasingly complex world conditions. The article describes specific features of the relationship between the Education Index and the Human Development Index and between the indices of national socio-economic development and the human capital development indices for the same countries. The complexity of paradigmatic relations between the categories of "education", "socio-economic development" and "human potential" is revealed through a comparative analysis of the countries based on the human development indicators. The following research methods are used in the study: a systematic genetic analysis of different human capital development indices for the world countries; comparative analysis of the human capital development in different countries of the world; conceptual and structural-functional analysis of reforms as changes in the national socio-economic development; and a qualimetric analysis of the indicators of the methods used to calculate human capital indices. The article describes some specific features of the relationship between such indicators of human capital development in different countries of the world as "education" and "social and economic development". The research findings are significant contributions to the political and educational anthropology and to such areas of expertise as education management and social policy. They can find their practical application in the theory and practice of vocational education to develop new knowledge modules for the courses "Comparative Analysis of Educational Reforms", "National Social Policies for Human Capital Development" and "Qualimetry in Human Capital Studies".

Keywords: Human Capital, Education Index, Development Anthropologemes

INTRODUCTION

In the 21st century, all the countries implementing their policies of national socio-economic development place a particular emphasis on the development of human capital as one of their national priorities. The current epoch is called the era of the Anthropocene, in which humans become the main subjects of environmental changes and of the scientific, technological and socio-economic development.

Different issues of the human potential development have been the focus of discussion by various professional and expert communities: annual sessions of the International Economic

Forum in Davos, the Organization for International Economic Cooperation (OECD), the World Bank (within the framework of the Knowledge for Development program), etc.

Modern societies are in the process of transition of national economies to a knowledge-based development model, in which human capital plays a primary role.

The performed cross-country analysis of human capital indices in different countries of the world is aimed to determine to what extent the development of human capital depends, on the one hand, on the national education system, and, on the other hand, on the national socio-economic development.

Many countries of the world, realizing the challenges of modern development, are constructing a new ideology of human development, which is based on expanding human capabilities, granting people the right to choose, recognizing their creative abilities and ensuring their involvement in designing changes. Such concepts of human development in the changing world become the basis of national strategies and reforms of socio-economic development, including educational reforms.

In our study, we explore some issues of the methodology for studying human capital and methods for calculating human capital development indices, as well as conditions for the successful development of human capital in the modern world.

The research findings reveal some specific features of paradigmatic relations between the categories of "education", "social and economic development" and "human capital".

MATERIALS AND METHODS

The article is aimed to identify specific features of the relationship between the Education Index and the Human Development Index in different countries of the world with the use of the comparative analysis, ranging countries by the Human Capital Index, and between the indices of national socio-economic development and the human capital development indices for the same countries.

The study of human development is associated with a number of topics covered in numerous scholarly works, such as human capital or human potential (Mokronosov & Krutin, 2017; Martynov & Gaydamashko, 2021) human capital and economy (Ustinova et al., 2015; Cooper et al., 2016; Sukiasyan 2018); investments in human capital (Grachev et al., 2016; Schultz, 1971); human capital and education (Kuzminov & Frumin, 2019; Subbotina, 2017; Çalıřkan, 2019; Çevik, 2019; Kapeliushnikov, 2021); and human capital development (Gimpelson & Kapeliushnikov, 2017; Psacharopoulos & Patrinos, 2018; Alekhina et al., 2016; Podberezkin, 2012).

To determine research methods for our study, we relied on the latest research findings on the methodology for exploring the category of "human capital", methods of measuring and assessing human capital (Mau & Klyachko, 2013; Nyberg et al., 2014; Lashko, 2016; Ivanov, 2014) and the materials posted on the sites of such communities as the United Nations (UN) (Borshch & Zharova, 2019; Parushina et al., 2017; Human development reports, 2020; Chhibber, 2020); the International Economic Forum (Human development reports, 2020; Human Capital Index, 2017); the Organization for International Economic Cooperation (OECD) (The Global Human Capital Report, 2017) and the World Bank (World Economic Forum, 2018; Organisation for Economic Co-operation and Development, 2018; World Bank, 2020; World Bank, 2021).

Our analysis of the above sources made it possible to identify the basic research methods, including a systematic genetic analysis of human capital development indices for the countries of

the world; comparative analysis of the human capital development in different countries; conceptual and structural-functional analysis of reforms as changes in the national socio-economic development; and a qualimetric analysis of indicators of the methods used to calculate the human capital indices.

In the 21st century, fundamental and applied research in the field of education and pedagogy, philosophy of education, sociology and cultural studies of education and educational policy have structured new principles of organizing education as a factor in human development. The new approaches to human development are based on the anthropologemes of development and new anthropological relations: People–Education, People–Future, People–Technology, People–Region/City (World Bank, 2020).

The anthropologeme of development, anthropologeme of sociality, anthropologeme of vitality, anthropologeme of subjectivity, anthropologeme of activity, anthropologeme of culture, anthropologeme of the future — all these concepts form the basis of new approaches to the development of human potential. This methodology creates new anthropopractices — practices of human development in various ways, including educational means. The specially organized practice of human development provides the basis for improving human qualities and competencies. The improved human qualities and competencies will become the human capital for the current and future development of the global society.

Such practice of human development requires the organizers of education to possess technological, methodological and humanitarian knowledge, i.e. understanding of scientific and technological development and the knowledge of advanced technologies (industrial, economic, social, etc.); the knowledge of the methodology of organizing human development; and the knowledge about the human beings themselves. This, in turn, makes new demands on the quality of the teachers' professional background (World Bank, 2020).

The era of technological (industrial) revolutions is characterized by the intensification of knowledge acquisition. The scientific and technological development causes updates in the content of education, which narrows the existing gap between the spheres of education and technology, further complicated by the fact that the old structure of knowledge does not reflect the structure of the life cycle of technologies.

The methodological basis of our study is formed by the following:

- The concept of human capital development;
- The concept of a qualimetric analysis of human capital development;
- The concept of a comparative analysis of the human capital indicators among different countries;
- Conceptual approaches to organizing and assessing socio-economic development;
- The concept of the education development management.

RESULTS

Let us consider the results of our cross-country analysis of educational systems and social and economic parameters. The cross-country analysis covers 30 countries selected on the following basis. The main indicator of the level of human capital development is the Human Development Index (HDI). However, to ensure a representative sample, we also used the ranking of the Global Human Capital Index (Human development reports, 2020).

"The COVID-19 pandemic has sunk the global economy into the deepest recession in eight decades. In the emerging and developing countries of Europe and Central Asia, GDP is

expected to contract 4.4 percent in 2020" (Organization for Economic Co-operation and Development, 2021). The global crises caused by the COVID-19 pandemic make it vital to preserve the human capital and to develop it further in the post-crisis period. Therefore, human capital is an area of global development that requires a lot of attention due to the serious impact of the COVID-19 pandemic on all spheres but especially on education, which is a powerful driver of the human capital development. For any country, its economic performance and the maturity of its society are the main indicators of the positive effect of the human capital development: "the higher the level of education of workers, the more active technological progress and the greater the susceptibility of society to innovations" (World Bank, 2019).

In 2017, the analytical group of the World Economic Forum (WEF), in cooperation with the Harvard University and the international consulting company Mercer Human Resource, Consulting prepared "The Global Human Capital Report 2017" (Human development reports 2020) describing their research findings on the human capital development.

It is worth noting that the authors of the report are considering the Global Human Capital Index (GHCI) as a dynamic, rather than static, concept. Publication of the Global Human Capital Index contributes to the development of education, which meets not only the needs of a particular country, but also global needs. "The Global Human Capital Report 2017 proposes a new benchmark for leaders to build the workforces of the future. The approach it advocates based on the principle that all people deserve an equal opportunity to develop their talents, provides leaders with the means and the tools to navigate the changes we are already witnessing from the current wave of automation and successfully navigate the transition to the Fourth Industrial Revolution.

Underpinning the Report, the Global Human Capital Index provides a means of measuring the quantifiable elements of the world's talent potential so that greater attention can be focused on delivering it. By measuring countries' talent resources holistically according to individuals' ability to acquire, develop and deploy skills throughout their working life rather than simply during the formative years, we hope to foster a true revolution in educational systems where education is geared to meeting the needs of the future workforce" (Human development reports, 2020).

The Global Human Capital Index is a combination of four subindexes: Capacity, Deployment, Development and Know-how. "The Capacity subindex quantifies the existing stock of education across generations; the Deployment subindex covers skills application and accumulation of skills through work; the Development subindex reflects current efforts to educate, skill and up skill the student body and the working age population; and the Know-how subindex captures the breadth and depth of specialized skills use at work" (Human development reports, 2020).

The analysis of the data presented in the Global Human Capital Report 2017 allowed us to systematize the accumulated information (Table 1).

No.	State	Country score (2015)	GHCI 2015	Country score (2017)	GHCI 2017	Change GHCI
1	Norway	2	83.84	1	77	↑
2	Finland	1	85.78	2	77	↓
3	Switzerland	3	83.58	3	76	const.
4	USA	17	79.64	4	74	↑

5	Denmark	7	82.47	5	74	↑
6	Germany	22	78.55	6	74	↑
7	New Zealand	9	81.84	7	74	↑
8	Sweden	6	82.73	8	73	↓
9	Slovenia	15	79.95	9	73	↑
10	Austria	11	81.02	10	73	↑
11	Singapore	24	78.15	11	73	↑
12	Estonia	16	79.88	12	73	↑
13	Netherlands	8	82.3	13	73	↓
14	Canada	4	82.88	14	73	↓
15	Belgium	10	81.12	15	72	↓
16	Russia	26	77.54	16	72	↑
17	Japan	5	82.74	17	72	↓
18	Israel	29	77.03	18	71	↑
19	Ireland	12	80.59	19	71	↓
20	Australia	13	80.22	20	71	↓
21	Iceland	20	78.86	21	71	↓
22	Czechia	25	77.6	22	71	↑
23	United Kingdom	19	79.07	23	71	↓
24	Ukraine	31	76.21	24	71	↑
25	Lithuania	18	79.33	25	70	↓
26	France	14	80.15	26	69	↓
27	Republic of Korea	30	76.84	27	69	↑
28	Latvia	23	78.39	28	69	↓
29	Kazakhstan	37	74.56	29	69	↑
30	Luxembourg	21	78.79	30	69	↓

Classification of the selected countries was performed based on the analysis of changes in the respective scores of the Global Human Capital Index (GHCI) from 2015 to 2017, which resulted in dividing the countries into three groups:

- **Group 1:** the countries with the increase in GHCI during the period from 2015 to 2017 (Norway, the USA, Denmark, Germany, New Zealand, Slovenia, Austria, Singapore, Estonia, the Russian Federation, Israel, Czechia, Ukraine, the Republic of Korea, Kazakhstan);
- **Group 2:** the countries with the increase in GHCI during the period from 2015 to 2017 (Finland, Sweden, the Netherlands, Canada, Belgium, Japan, Ireland, Australia, Iceland, the United Kingdom, Lithuania, France, Latvia, Luxembourg);
- **Group 3:** the countries without changes in GHCI during the period from 2015 to 2017 (Switzerland).

Representativeness of our sample is confirmed by the Human Development Index data presented in the Human Development Report 2020 published by the United Nations (Grachev et al., 2016). "Human Development Index (HDI): A composite index measuring average achievement in three basic dimensions of human development — a long and healthy life, knowledge and a decent standard of living" (Borshch et al., 2019). According to the Human Development Report data, the counties selected for our analysis (except for Ukraine) belong to a group of countries with very high scores of the Human Development Index (HDI). As one of the indicators affecting the Human Development Index (HDI) is the level of the education

development, let us consider the correlation between the HDI and the Education Index in the countries in the sample.

The analysis is based on the data of the Human Development Reports 2020 (Borshch et al., 2019, Parushina et al., 2017).

First of all, we should note that in all the groups of our sample the Education Index correlate with the Human Development Index (Figure 1).

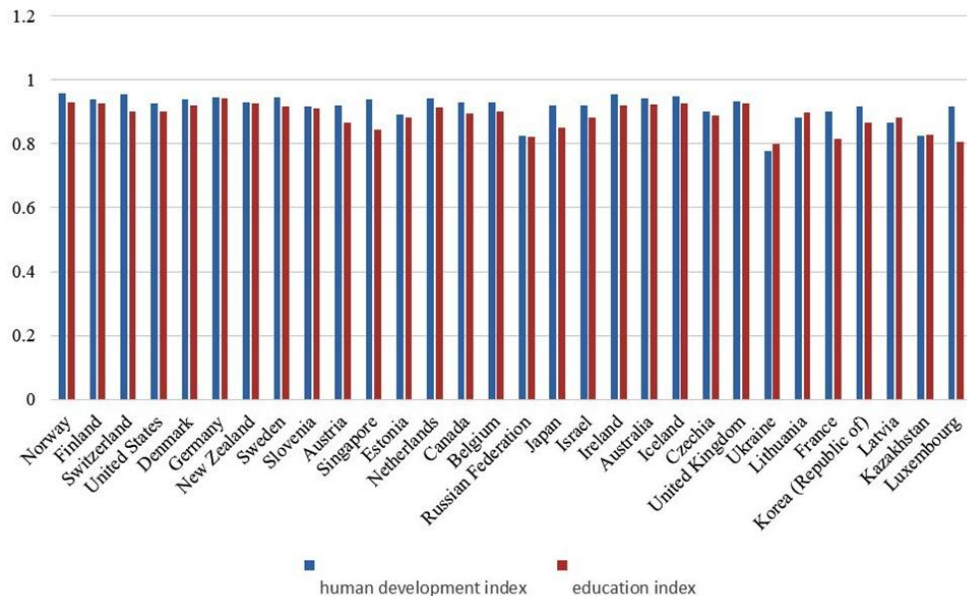


FIGURE 1
CORRELATION BETWEEN THE HUMAN DEVELOPMENT INDEX AND THE EDUCATION INDEX

The Education Index is the average of the combination of adult years of schooling and expected years of schooling for children, expressed as an index. Data in Figure 1 show that the higher the Education Index, the higher the Human Development Index. Germany has the maximum Education Index score of 0.943, and Ukraine — the minimum of 0.799. At the same time, the Education Index of 0.799 in Ukraine is higher than the Human Development Index (HDI) of 0.779. Moreover, Ukraine is no exception. For example, Kazakhstan: HDI of 0.825, and the Education Index of 0.83; Lithuania: HDI of 0.882, and the Education Index of 0.898; Latvia: HDI of 0.866, and the Education Index of 0.883.

The Education Index is calculated based on a large number of indicators. In our study, we consider the impact of individual indicators on the human potential development. The analysed indicators contributing to the Education Index are the following: expected years of schooling; government expenditure on education as % of GDP; gross enrolment ratio, pre-primary, as % of preschool-age children; gross enrolment ratio, primary, as % of primary school-age population; gross enrolment ratio, secondary, as % of secondary school-age population; gross enrolment ratio, tertiary, as % of tertiary school-age population; mean years of schooling; and population with at least some secondary education as % of ages 25 and older.

Other important indicators are the literacy rate, adult, as % of ages 15 and older; percentage of primary schools with access to the internet and percentage of secondary schools with access to the internet; however, there is no data on these indicators for the analysed countries.

Figure 2 illustrates the relationship between the indicator "expected years of schooling (years)" and the Education Index. The analysis of these data demonstrates that the higher the indicators of "expected years of schooling", the higher the Education Index in the country. The maximum score of "expected years of schooling" is 22 years (Australia), the minimum — 14.3 years (Luxembourg).

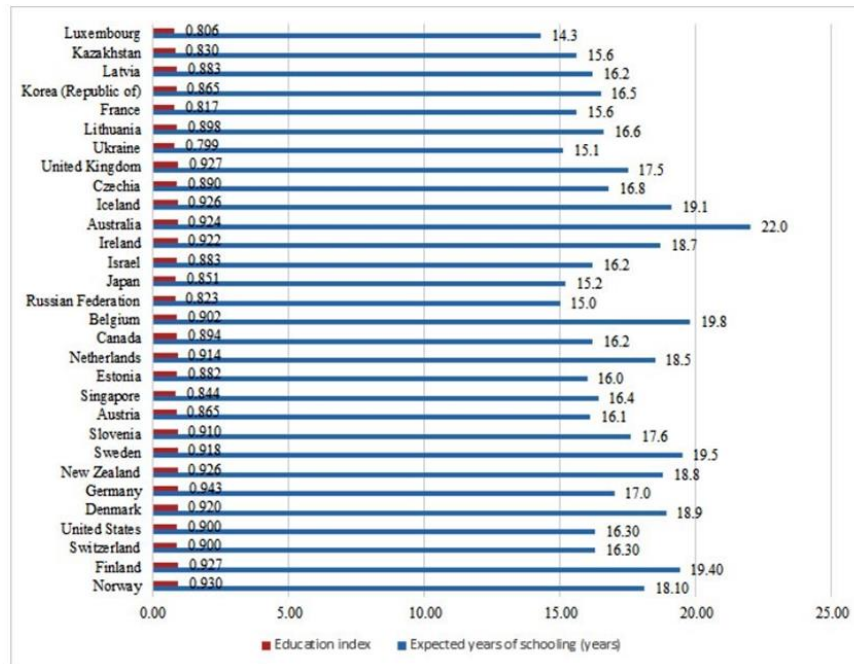


FIGURE 2
RELATIONSHIPS BETWEEN THE EXPECTED YEARS OF SCHOOLING AND THE EDUCATION INDEX

The score of "expected years of schooling" is traditionally high in Belgium (19.8 years), Finland (19.4 years) and Sweden (19.5 years), which is not surprising. It should be noted that Belgium, Finland and Sweden belong to the group of countries in which the scores for the Global Human Capital Index decreased in the period from 2015 to 2017.

At the same time, the Education Index scores for Belgium, Finland and Sweden are rather high: 0.902 in Belgium, 0.927 in Finland and 0.918 in Sweden. This can be explained by the stability of the educational systems in these countries and their immunity to any kind of changes, both external and internal. We should mention that the Human Development Index score for each of these countries is high: 0.931 in Belgium, 0.938 in Finland and 0.945 in Sweden.

It is interesting that the scores of "expected years of schooling" for the countries of Group 1 are lower than for the countries of Group 2, varying in the range from 15.1 years (Ukraine) to 18.9 years (Denmark), while their Education Index scores vary in the range from 0.799 (Ukraine) to 0.943 (Germany). The Human Development Index score is the lowest for Ukraine (0.779) and the highest for Norway (0.957).

The comparison between the scores for "expected years of schooling" and "mean years of schooling" also produces some interesting results. In all countries the scores for the indicator "mean years of schooling" are lower than for "expected years of schooling", which is illustrated by Figure 3.

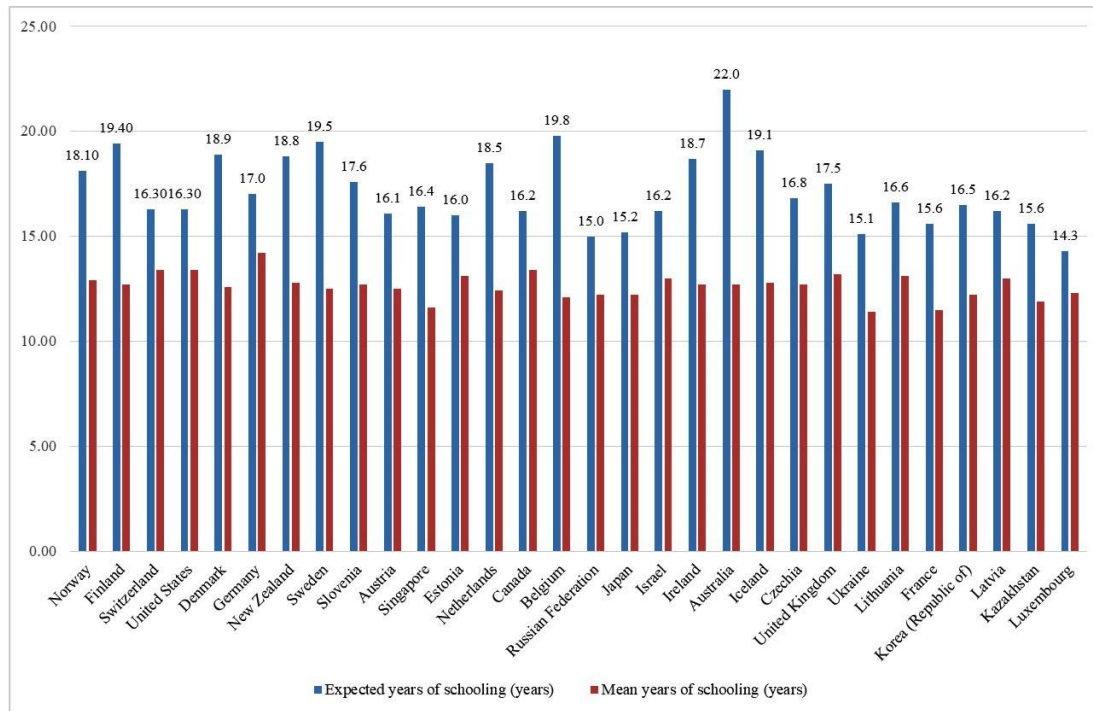


FIGURE 3

CORRELATIONS BETWEEN EXPECTED YEARS OF SCHOOLING (YEARS) AND MEAN YEARS OF SCHOOLING (YEARS)

While the scores of "expected years of schooling" vary in the range from 14.2 years in Luxembourg to 22 years in Australia, the actual situation with the schooling duration, characterised by the indicator "mean years of schooling", looks as follows: the range is from 11.4 years (Ukraine) to 14.2 (Germany). The minimum deviation of the mean years of schooling from the expected years of schooling is in Luxembourg (2 years), the maximum — in Belgium (7.7 years).

One of the key indicators characterising the Education Index is the share of government expenditure on education (% of GDP). The increase in education-related investments can certainly be considered one of the important signs of the human capital development. "The concept of the rate of return on investment in education is very similar to that for any other investment. It is a summary of the costs and benefits of the investment incurred at different points in time, and it is expressed in an annual (percentage) yield, like that quoted for savings accounts or government bonds. Returns on investment in education based on human capital theory have been estimated since the late 1950s. Human capital theory puts forward the concept that investments in education increase future productivity" (Çalışkan, 2019).

However, the problem is that in many countries, the return on investment in education is not always complemented by the aggregate return for the country as a whole. Our analysis shows that the highest level of government expenditure on education is recorded in Norway (8% of GDP), Sweden (7.7% of GDP), Denmark (7.6% of GDP) and Iceland (7.5% of GDP). The lowest levels of expenditure on education are recorded in Kazakhstan (2.8% of GDP), Singapore (2.9% of GDP) and Japan (3.2% of GDP). The correlation between the Education Index, expected years of schooling (years) and government expenditure on education (% of GDP) is illustrated by Figure 4.

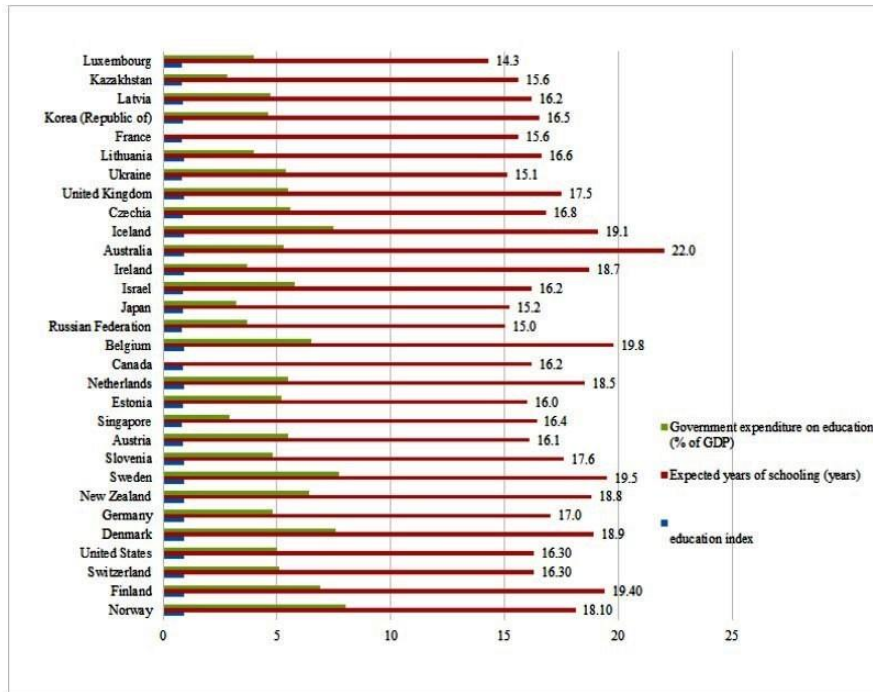


FIGURE 4

CORRELATIONS BETWEEN EDUCATION INDEXES, EXPECTED YEARS OF SCHOOLING AND GOVERNMENT EXPENDITURE ON EDUCATION

The following indicators are also very important: gross enrolment ratio, pre-primary (% of preschool-age children), gross enrolment ratio, primary (% of primary school-age population), gross enrolment ratio, secondary (% of secondary school-age population) and gross enrolment ratio, tertiary (% of tertiary school-age population). The data for them are summarized in Table 2.

Country	Gross enrolment ratio, pre-primary (% of preschool-age children)	Gross enrolment ratio, primary (% of primary school-age population)	Gross enrolment ratio, secondary (% of secondary school-age population)	Gross enrolment ratio, tertiary (% of tertiary school-age population)
Norway	95	100	117	82
Finland	84	100	154	88
Switzerland	104	105	102	60
United States	73	102	99	88
Denmark	96	101	129	81
Germany	109	104	98	70
New Zealand	91	100	115	82
Sweden	96	127	153	67
Slovenia	92	100	116	79
Austria	104	103	100	85
Singapore	no data	101	108	85
Estonia	92	97	118	70
Netherlands	94	104	136	85
Canada	no data	101	114	69

Belgium	115	104	159	80
Russian Federation	87	103	103	82
Japan	no data			
Israel	111	105	105	63
Ireland	163	101	125	78
Australia	165	100	150	113
Iceland	94	100	118	72
Czechia	106	101	103	64
United Kingdom	106	101	126	60
Ukraine	no data	99	96	83
Lithuania	88	104	108	72
France	106	103	104	66
Korea (Republic of)	95	98	100	94
Latvia	96	99	111	88
Kazakhstan	62	104	113	62
Luxembourg	92	102	104	19

The analysis of data presented in Table 2 makes it possible to conclude that, while the values of "gross enrolment ratio, pre-primary" vary in the range from 73% of preschool-age children in the United States to 165% in Australia, the values of "gross enrolment ratio, primary" vary in the range from 97% of primary school-age population in Estonia to 127% in Sweden. Moreover, the deviations between the countries are less significant for the latter indicator. The values of "gross enrolment ratio, secondary" vary in the range from 96% of secondary school-age population in Ukraine to 154% in Finland. The scores for "gross enrolment ratio, tertiary" do not achieve the level of 100 % of tertiary school-age population (the only exception is Australia with 113%), and Luxembourg demonstrates the minimum score of 19%. We should mention the availability of preschool, primary and secondary education in such countries as Norway (95%–100%–117%), Finland (84%–100%–154%), Denmark (96%–101%–129%), New Zealand (91%–100%–115%) and some others. However, Germany demonstrates the reverse trend, with the maximum affordability of pre-school education, while in the transition to higher stages of education the enrolment decreases: gross enrolment ratio, pre-primary — 100% of preschool-age children; gross enrolment ratio, primary — 109% of primary school-age population; gross enrolment ratio, secondary — 98% of secondary school-age population; and gross enrolment ratio, tertiary — 70% of tertiary school-age population. In a number of countries we observe a "fluctuating" trend, with the gross enrolment ratio, primary, as % of primary school-age population lower as compared with the gross enrolment ratio, pre-primary, as % of preschool-age children; the gross enrolment ratio, secondary, as % of secondary school-age population higher than the gross enrolment ratio, primary; and the gross enrolment ratio, tertiary, as % of tertiary school-age population lower than the gross enrolment ratio, secondary. This trend is obvious, for example, in Czechia (106%–101%–103%–64%) and in Ireland (163%–101%–125%–78%). Moreover, if there is an increase in the gross enrolment ratio, primary, as % of primary school-age population, the next indicator of gross enrolment ratio, secondary, as % of secondary school-age population is also higher. At the same time, there is another distinctive trend in Australia: the high gross enrolment ratio, pre-primary, of 165% is followed by the low gross enrolment ratio,

primary, of 100%, which, in turn, is followed by a higher gross enrolment ratio, secondary, of 150%. So, in spite of the fact that Australia's gross enrolment ratio, tertiary, of 113% is the highest among all studied countries, it is too low for Australia itself.

One of the human capital development indicators is "population with at least some secondary education (% ages 25 and older)" — the more people in the country have at least secondary education, the higher the basic literacy of the population. "Any investment in post-secondary education has to recognize the importance that lifelong learning will have in the coming decades. As the population in the region ages, investment will need to be made in the education of people who have already finished their formal education, in order to help support productive aging" (Organisation for Economic Co-operation and Development, 2021).

Figure 5 illustrates the range of the percentages of the population with at least some secondary education (ages 25 and older) in the studied countries.

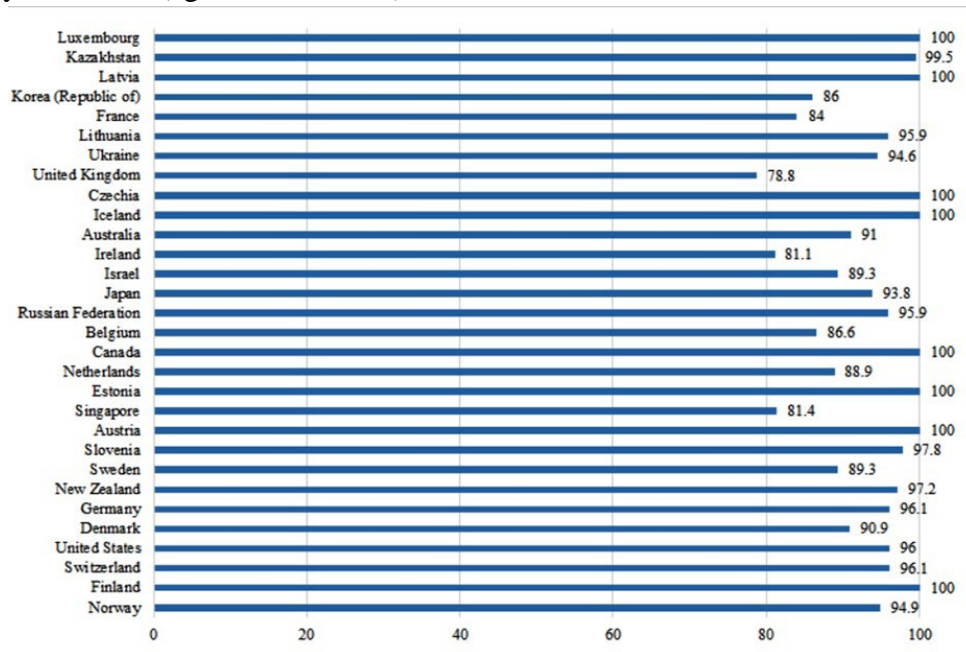


FIGURE 5
POPULATION WITH AT LEAST SOME SECONDARY EDUCATION (% AGES 25 AND OLDER) IN THE SAMPLE COUNTRIES

The percentages of the population with at least some secondary education vary in the range from 78.8% in the United Kingdom to 100% in Luxembourg, Latvia, Czechia, Iceland, Canada, Estonia, Austria and Finland. In a large group of countries, the percentages of the population with at least some secondary education vary in the range from 90 to 100% (Norway, Switzerland, the United States, Denmark, Germany, New Zealand, Slovenia, the Russian Federation, Japan, Australia, Ukraine, Lithuania and Kazakhstan).

"Technological change and its impact on labour markets calls for a renewed focus on how the world's human capital is invested in and leveraged for social well-being and economic prosperity for all. Many of today's education systems are already disconnected from the skills needed to function in today's labour markets and the exponential rate of technological and economic change is further increasing the gap between education and labour markets. Furthermore, the premise of current education systems is on developing cognitive skills, yet behavioural and non-cognitive skills that nurture an individual's capacity to collaborate, innovate,

self-direct and problem-solve are increasingly important. Current education systems are also time-compressed in a way that may not be suited to current or future labour markets. They force narrow career and expertise decisions in early youth. The divide between formal education and the labour market needs to be overcome, as learning, R&D, knowledge-sharing, retraining and innovation take place simultaneously throughout the work life cycle, regardless of the job, level or industry" (Human development reports, 2020).

Let us consider some of the indicators of the countries' socio-economic development and their impact on the system of education and the development of human capital.

One of the main indicators of the national socio-economic development is the Gross National Income (GNI). Figure 6 shows gross national income (GNI) per capita (constant 2017 PPP \$) as compared with GDP per capita (2017 PPP \$) for the analyzed countries.



FIGURE 6

CORRELATIONS BETWEEN GROSS NATIONAL INCOME (GNI) PER CAPITA AND GDP PER CAPITA FOR THE SAMPLE COUNTRIES

Our analysis shows that the countries in the sample can be divided into two groups by their GDP/GNI correlation: the countries in which GDP is lower than GNI (Norway, Switzerland, the United States, Germany, Denmark, Sweden, Netherlands, Belgium, Japan, Israel, Ukraine, France and the Republic of Korea) and the countries in which GDP is higher than GNI (Finland, New Zealand, Slovenia, Austria, Singapore, Estonia, Canada, the Russian Federation, Ireland, Australia, Iceland, Czechia, the United Kingdom, Lithuania, Latvia, Kazakhstan and Luxembourg). The highest income index scores are recorded for Singapore (1) and Luxembourg (0.995). The countries in which GDP is lower than GNI, the income index varies from 0.906 (Israel) to 0.988 (Switzerland). The only exception is Ukraine (income index of 0.738 is the lowest among all the countries in our sample), which is not surprising, as only Ukraine does not belong to the group of countries with high human development indices. For the countries in which GDP is higher than GNI, the income index varies from 0.821 (Kazakhstan) to 1 (Singapore).

"Differences in human capital have large implications for the productivity of the next generation of workers. In a country at around the 25th percentile of the distribution of each of the components, a child born in 2018 will be only 43 percent as productive as that child would be under the benchmark of complete education and full health.

The index, because of its units, can be connected in a straightforward fashion to scenarios for future per capita income and growth" (World Bank, 2020).

Inequality is one of the global problems of humanity. The COVID-19 pandemic has only aggravated the situation. Analysing the reported data, we can see that even in the countries with a very high level of human development the coefficient of human inequality varies in the range of 4.4 in Czechia to 12.8 in Singapore, which, of course, is directly reflected in the inequality in education: in Czechia this indicator has the minimum value if 1.4%, in Singapore — the maximum of 11%. The inequality-adjusted HDI (IHDI) and inequality-adjusted education index are also correspondingly affected (Table 3).

Country	Human Development Index	Inequality-adjusted HDI (IHDI)	Education index	Inequality-adjusted education index
Norway	0.957	0.899	0.93	0.908
Finland	0.938	0.888	0.927	0.907
Switzerland	0.955	0.888	0.9	0.883
United States	0.926	0.808	0.9	0.875
Denmark	0.94	0.883	0.92	0.894
Germany	0.947	0.869	0.943	0.922
New Zealand	0.931	0.859	0.926	0.909
Sweden	0.945	0.882	0.918	0.884
Slovenia	0.917	0.875	0.91	0.891
Austria	0.922	0.857	0.865	0.84
Singapore	0.938	0.813	0.844	0.751
Estonia	0.892	0.829	0.882	0.862
Netherlands	0.944	0.878	0.914	0.865
Canada	0.929	0.848	0.894	0.87
Belgium	0.931	0.859	0.902	0.828
Russian Federation	0.824	0.74	0.823	0.789
Japan	0.919	0.843	0.851	0.812
Israel	0.919	0.814	0.883	0.834
Ireland	0.955	0.885	0.922	0.892
Australia	0.944	0.867	0.924	0.899
Iceland	0.949	0.894	0.926	0.9
Czechia	0.9	0.86	0.89	0.878
United Kingdom	0.932	0.856	0.927	0.902
Ukraine	0.779	0.728	0.799	0.77
Lithuania	0.882	0.791	0.898	0.863
France	0.901	0.82	0.817	0.74
Korea (Republic of)	0.916	0.815	0.865	0.789

Latvia	0.866	0.783	0.883	0.861
Kazakhstan	0.825	0.766	0.83	0.766
Luxembourg	0.916	0.826	0.806	0.756

The analysis of data presented in Table 3 reveals that the unresolved problem of inequality entails a decrease in the main indicators characterizing human capital and the level of its development, despite the stable and developed education systems in the studied countries.

Another very important characteristic of the socio-economic situation in any country is the unemployment rate. For the purposes of our study, we considered such indicators as "unemployment, total (% of labour force)", "unemployment, youth (% ages 15–24)" and "youth not in school or employment (% ages 15-24)" (Figure 7).

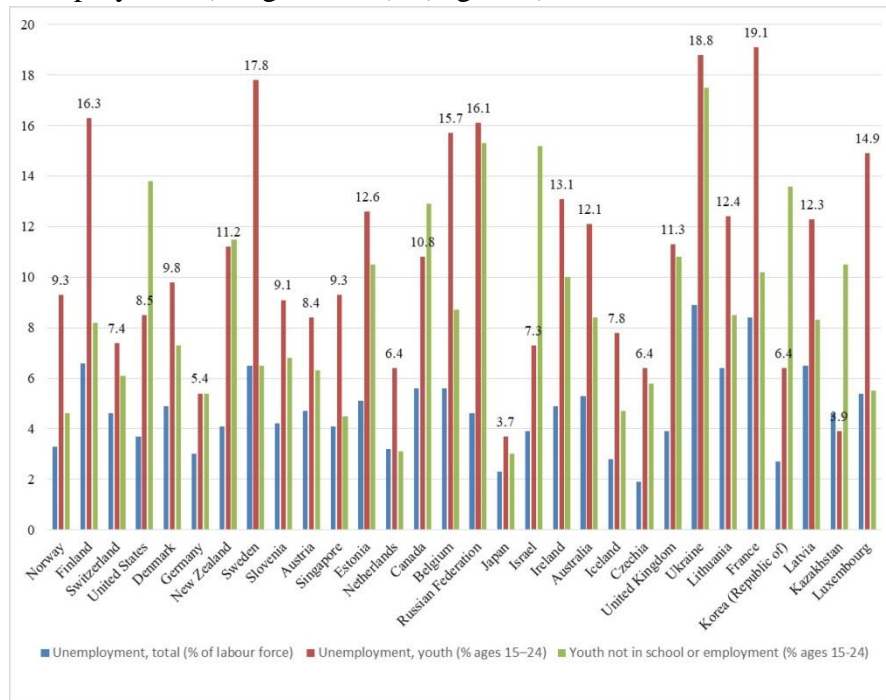


FIGURE 7

CORRELATION BETWEEN UNEMPLOYMENT, TOTAL, AS % OF LABOUR FORCE, UNEMPLOYMENT, YOUTH AS % OF AGES 15–24 AND YOUTH NOT IN SCHOOL OR EMPLOYMENT AS % OF AGES 15-24

The highest level of unemployment in the category "youth (% ages 15–24)" is recorded in France (19.1%), Ukraine (18.8%) and Sweden (17.8%). At the same time, the indicators of "unemployment, total" in France and Ukraine have the highest values of 8.4% and 8.9% respectively, while in Sweden "unemployment, total" is only on the level of 6.5%. However, "unemployment, total" of 1.9% in Czechia is the lowest among the studied countries, while "unemployment, youth" is much higher — 6.4%. Another worrisome indicator is "youth not in school or employment" as percentage of ages 15–24. This indicator exceeds 15% in a number of countries: Ukraine (17.5%), the Russian Federation (15.3%) and Israel (15.2%).

DISCUSSION

Today, under conditions of the COVID-19 pandemic, the world is facing a challenging task of preserving and developing the human capital. The pandemic-related restrictions not only

disrupted the labour market, but also drastically limited investment, affected trade and financial markets, and changed the situation on the labour market.

In our study, considering human capital as one of the main factors of global economic development, we have identified the relationship between the trends in the human capital development and various characteristics of the system of education, on the one hand, and social and economic parameters, on the other hand.

Our cross-country comparative analysis has made it possible to establish a relationship between some characteristics of the education system (the level of education among population, the structure of enrolment in preschool, primary, secondary and tertiary education institutions and the expected and actual duration of education) and the human capital development.

The findings of our study confirm the hypothesis that there is a definite relationship between the education system and the development of human capital.

In the course of our research, we found out that a high level of the education among population, low ratio of the expected and actual duration of education, high enrolment in preschool, primary, secondary and tertiary education institutions and a high percentage of population with at least secondary education directly correlate with the scope of opportunities existing in the country for the development of human capital. The directly proportional relationship between education and human capital is bilateral. On the one hand, education in the modern world is the basis, the foundation of human capital. On the other hand, the human capital can only become the capital of a particular person if the person is able to use the abilities and skills in real activity. Besides, education today is an area of investment, determining not only the pace, but also the quality of economic growth. Education creates human capital as the most important factor in the country's socio-economic development, being at the same time a constantly developing sector of the economy.

But now, under conditions of the COVID-19 pandemic, there are real threats for the education systems, human capital and socio-economic development of all the countries, associated with the aggravation of negative phenomena both in the economy (GDP decrease, lower levels of income among the population) and in the social sphere (unemployment, widening of social inequality).

The growth of unemployment provokes worsening of social inequality. Children from families of different social status have different opportunities for their human capital development. The growing problem of social inequality can lead to a reduction in the number of students at different stages of education, which will certainly lead to a decrease in the level of human capital.

The findings of our cross-country analysis show that the development of human capital depends on the economic growth rates, labour productivity, the level and structure of unemployment and the level of social inequality.

CONCLUSION

There are complex paradigmatic relations between the categories of "human capital", "education" and "socio-economic development". If we consider the category of "education" from the standpoint of human capital development, the country's socio-economic development is the foundation for the education system. If we consider the category of "human capital" as a criterion for measuring the education effectiveness, the socio-economic development is a factor in the successful performance of the education system. If we consider the category of "socio-economic

development" as a factor in the human capital development, education plays the role of the human capital basis. If we consider human capital as a criterion for assessing the level of socio-economic development, education is an indicator of the achievements of socio-economic development. If we consider education as a factor of socio-economic development, the human capital can be considered as a criterion for the effectiveness of socio-economic development.

Considering the categories of "human capital", "education" and "socio-economic development" in their strong interrelationship, we should keep in mind that the range and breadth of opportunities for the human capital development are determined by the level of socio-economic development of the country and the quality and stability of the education system in the face of external negative factors.

Taking into account that the main conclusions drawn from this study reveal the specific features of the relationship between indicators of human capital development in the countries of the world, we have developed three groups of recommendations:

- qualimetric — on the tools for measuring the human capital development and calculating assessment indices;
- organizational and managerial — on the management of changes in social policy and in education,
- methodological and didactic — on a practical application of the study results in the theory and practice of vocational education to develop new knowledge modules in the courses "Comparative Analysis of Educational Reforms", "National Social Policies for Human Capital Development" and "Qualimetry in Human Capital Studies".

The research findings are significant contributions to the political and educational anthropology and to such areas of expertise as education management and social policy. They can find their practical application in the theory and practice of vocational education to develop new knowledge modules for the courses "Comparative Analysis of Educational Reforms", "National Social Policies for Human Capital Development" and "Qualimetry in Human Capital Studies".

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