

THE PARADIGM OF HUMAN CAPITAL IN THE CONTEXT OF DIGITALIZATION ACROSS COUNTRIES

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ABSTRACT

Digital transformations of the modern world economy pose new requirements for the resource potential of states. Improving the country's competitiveness in the context of digitalization is associated not only with the development of serious potential. Main market directions are innovative digital information technologies and developments. The dominant role in the organization of activities is the ownership of information resources and methods for their effective use. Scientific and technological progress in the field of digitalization increases the importance of human capital as a means of achieving results, promotes the importance of physical activity in comparison with cognitive activity within the framework of production - the requirements for the level of education, digital literacy, creativity and intelligence of staff are being re-established. The development of human capital is of great socio-economic importance not only for organizing efficient production activities, but also for the country as a whole. Investments in human capital (in health, education, and the development of digital literacy of personnel) contribute to raising the level of labor productivity, GDP per capita, as well as living standards. The level of human capital within the country depends on the level of its innovative development, standard of living, strategic orientation and policy of the authorities in the field of formation of human resources. The purpose of this article is to analyze the characteristics of the formation and development of human capital across countries. In the first part of the paper, we characterize the ontology of human capital and coherent and integration investment factors that influence the formation of anisotropy within human capital. In the second part of the work, we will analyze the level of human capital across countries; compare the countries of the world in terms of education quality, health status, development of digital literacy of the population and implementation of investment measures in the field of human potential development. In the third part of the work, it is extrapolated as the differentiation of factors that form the level of human capital contributes to an increase in the level of capital and an increase in the quality of life within the country.

Keywords: *Human capital, Digitalization, Digital literacy*

1. INTRODUCTION

The current trends in the knowledge economy, the digitalization of society, increase the importance of human capital (particularly its cognitive capacity) and information in the

country's wealth. Born with certain abilities and genetic characteristics, an individual during the period of his life receives various kinds of knowledge and experience that make up human potential, which, subsequently, forms human capital. It depends on various factors influencing it. Necessary skills are also formed that make up various forms of the country's human capital. Differences in the level of factors of influence on human capital in the inter-country dimension contribute to the formation of its paradigm for various characteristics, such as life expectancy, level of education, digital literacy, etc. Identification of the peculiarities of the influence of various factors, as well as the level of state investment activity in the field of human capital formation on its formation and structure is the most relevant at present, since the use of world experience in the formation of competitive resources will help to avoid mistakes and identify bottlenecks in the development strategy of a particular subject in particular. In order to identify the features of the analysis within this work, we consider ontology of the «human capital» concept. The basis for the formation of the human capital essence as a resource producing income is based on the arguments of W. Petty, who puts forward in his scientific work "Political Arithmetic" the possibility of evaluating a person's abilities in monetary terms [6]. A. Smith and D. Stuart are considered to be the founders of the theory of human capital, implying by this concept the level of a person's ability to work [7]. According to A. Smith, a person needs to make capital investments in the formation of his own human potential (for example, in education) in order to be able to earn in the future. Modern trends in the development of the theory of human capital originate in the 50s of the XX century - their emergence is associated with increased interest in a person as a production factor, requiring investment and able to generate income. Among scholars of this direction, T. Schultz can be singled out, who was one of the first to suggest the presence of productive characteristics in human capital - the ability to reproduce and accumulate [6], as well as G. Becker, in whose opinion "human capital is formed through investment in a person, among which are the costs of education, training in production, the costs of health care, migration, and the search for information on prices and income" [1]. Among foreign researchers considering the formation and essence of human capital, a significant contribution to the development of this notion was made by: A. Smith, I. Bowen, J. Mincer, D. Stuart, D. Gilbert, G. Becker, T. Schultz, E. Flamholtz, J. K. Galbraith, F. Welch, , M. Malone, J. Psacharopoulos, E. Brooking, E. Lather, L. Edwinsson, H. St. Onge, J. Fickens, D. Duffey, R. Layard, B. Chiswick, W. Petty and others. National researchers involved in the development of human capital are: V. Bagov, E.B. Ermishina, E. Seleznev, B. B. Leontiev, V. Stupakov, I. A. Ivanyuk, O.B. Kazakova, K.R. Adamadziev, T. Astakhova, T.Yu. Feskova, S.A. Dyatlov, I.I. Prosvirin, R.I. Kapelyushnikov, L.G. Simkina, I. Ilyinsky, etc. The content analysis of foreign and national literature allows us to deduce the inferences on the difference in approaches to the interpretation of the essence of "human capital" concept, its components, as well as the need and species diversity of its investment. Analyzing the various points of view of scientists on the human capital components [10,3,2], we can conclude that its main components are the level of health, education, acquired skills and qualities, as well as in connection with the spread of digital technologies in the modern world, the presence of digital skills in the population. The formation of a country's competitive human capital is based on the degree of development of the main directions for acquiring knowledge and skills, as well as for preserving the personal resources of an individual (such as health). Consequently, a research of the human capital condition in states with consideration of the main factors level that influence it in accordance with the characteristics of the countries, the degree of investment activity of state bodies in the development of capital-forming spheres of public life, will allow us to deduce objective inferences on the dependence of the capital level on specific features of the of countries development, and also, applying the experience of other states, to avoid mistakes in the formation of modern human capital.

2. HUMAN CAPITAL FROM THE INTER-COUNTRY PERSPECTIVE

Human capital is one of the key resources contributing to the modern development of the countries and the world as a whole. Depending on country differences in the standard of living of the population, education, and the development of the healthcare system, the paradigm of capital is changing, and, consequently, the level of competitiveness of its components. An analysis of the human capital level across countries will help to form an idea of the influence of various factors on the quality of a resource, as well as deduce the inferences on the development degree of country policies in this notion. Among the indicators characterizing the level of human capital of the countries in the world, one can single out the Human Development Index, which includes the level of education, life expectancy, and living standards of the population. Let's consider the ranking of countries in terms of human development index in table 1.

Table 1: World Human Development Index

Ranking	Country	The weight of the Human Development Index
1	Norway	0,954
2	Switzerland	0,946
3	Ireland	0,942
4	Germany	0,939
5	Hong Kong	0,938
6	Australia	0,938
7	Iceland	0,937
8	Sweden	0,935
9	Singapore	0,933
10	the Netherlands	0,930

Source: United Nations Development Program

Norway has the highest level of human capital development among the countries of the world - a country with a high level of population safety, environmental quality, wages and education, as well as relatively high per capita incomes. In addition to Norway, the top ten countries also include countries such as Switzerland, Ireland, Germany, Hong Kong, Australia, Iceland, Sweden, Singapore and the Netherlands, which also have a high level of basic indicators of human capital development. The Human Development Index is not the only the indicator when considering the conditions for the formation of human capital, the creation of the most complete picture of human capital and the factors that influence it in the inter-country perspective, will allow the analysis of the components of the index in the framework of the research. In present-day developments as well as in the light of recent world events, one of the most important components of human capital is the level of health that makes up the physical form of human capital. Low levels of public health, a decrease in life expectancy, an increase in the number of chronic diseases, both of viral origin and those caused by the characteristics of the body and lifestyle (obesity, cancer, etc.) reduce the quality of human capital in the country and increase the level of capital investments in public health, healthcare, and also lowers the level of efficiency of investment in other areas. According to the analysis of the health level in different countries of the world, carried out by experts of the Bloomberg Healthiest Country Index [11] based on a selection of 169 countries by the level of health index, the country with the highest level of health in the world is currently Spain (table 2).

Table following on the next page

Table 2: World Health Rankings

Ranking		Country	Health index		Dynamics	Health expenditures,% of GDP
2019	2017		2019	2017		
1	6	Spain	92,75	96,56	-3,81	9,0
2	1	Italy	91,59	95,83	-4,24	8,9
3	2	Iceland	91,44	96,11	-4,67	8,3
4	7	Japan	91,38	95,59	-4,21	10,9
5	3	Switzerland	90,93	94,71	-3,78	12,2
6	8	Sweden	90,24	94,13	-3,89	10,9
7	5	Australia	89,75	93,96	-4,21	9,3
8	4	Singapore	89,29	93,19	-3,90	4,5
9	11	Norway	89,09	93,25	-4,16	10,5
10	9	Israel	88,15	92,01	-3,86	7,3

Source: Bloomberg Healthiest Country Index, World Health Organization: National Health Account Statistics, 2019

Japan also shows a significant increase in the level of health - the only Asian country among the top ten in the ranking - the country's indicator grew by 3 points - according to the analysis, the country's standard of living has decreased by 4.21 since 2019. Researchers are of the view that the increase in the level of health in Spain is caused by the peculiarities of the nutritional behavior of the population - the use of Mediterranean products helps to reduce the number of cancer and cardiovascular diseases in the country. Moreover, this dynamics is associated with the policy of public authorities in the field of health, among the main areas of development of which is the treatment of chronic diseases and the analysis of lifestyle factors such as obesity [9]. The growth in the ranking of countries such as: Italy, Japan, Iceland, Switzerland, Sweden, Singapore, Israel and Norway, according to Bloomberg researchers, is also due to the impact on the level of health of high quality health care - the organization of preventive measures for citizens, starting from the first years life, the high level of accessibility of medical services, significantly affect the growth of the level of public health in countries. Russia takes 95th place in the ranking, having a rather low value of the health index associated with high rates of alcohol consumption in the country, the number of suicides and the dynamics of deaths from violent acts, lagging behind Chile (33rd place), Belarus (81st place), Ukraine (93rd place) and Venezuela (87th place). According to K. Murray, the gap between the countries will be maintained by differences in the income level of the population, affecting both the possibility of obtaining high-quality medical services and the degree of education of the population (in particular, in the field of the basics of good nutrition, hygiene and bad habits) [13]. The development of digital technologies, the widespread computerization and softization, increase the importance of the cognitive characteristics of human capital over physical characteristics. Compared to the physical form, intellectual human capital as an investment considers a high-quality educational system that allows developing the individual's creative abilities, the level of work culture, and also providing the necessary knowledge base for further activities. As an indicator allowing deducing the inferences on the level of education in the countries, we use the Education Index - a combined index of the UN Development Program. The value of the Education Index, which characterizes the level of education of the country's population, consists of two indicators:

1. Adult Literacy Index;
2. The index of the total share of students in primary, secondary and higher education.

Let's consider the ranking of the countries by level of education in table 3.

Table 3: Ranking of countries by level of education in 2019

Ranking	Country	Index	Expenditures on education,% of GDP
1	Germany	0,946	4,6
2	Australia	0,923	5,1
3	New Zealand	0,923	7,2
4	Denmark	0,920	8,7
5	Norway	0,919	7,3
6	Iceland	0,918	5,7
7	Ireland	0,918	7,8
8	the United Kingdom	0,916	5,6
9	Finland	0,915	6,8
10	Sweden	0,914	7,3
34	Russia	0,832	4,1

Source: World Countries Ranking by Education. Humanitarian Encyclopedia

The first place in the ranking of countries in terms of education is Germany - in contrast to the United States, which has a significant number of "reputable" educational institutions that are among the ten best universities in the world; the number of literate people in the country exceeds the value of both the USA and England. The German education system is characterized by a large number of universities (250), a simple standard system of admission, both for the local population and for foreign students. In addition, within the framework of the country, support is provided for gifted students in the form of various scholarships, as well as an interest-free loan for study. Among the countries providing equal conditions for the admission of foreign and local students, we can single out the UK - a country with a high level of education. Educational institutions in the UK are among the most prestigious in the world - Oxford University, Cambridge University, Imperial College London, while studying in the country is significantly cheaper than the United States, a huge selection of study programs, as well as the possibility of official employment of students during the educational process. The level of Russia in the ranking of countries in terms of education is quite low - the country lags behind in the education of citizens from countries such as Belarus, Georgia, Japan and France. Among the negative aspects of the Russian education system we can distinguish: the predominance of the theoretical part over the practical, overload of the educational process with additional disciplines, a low level of infrastructure provision and the obsolescence of the scientific base of the universities, as well as the enrollment of students according to the results of the unified state exam. In addition, to increase the level of education in the country, as well as the education of citizens, it is necessary to increase governmental spending on education, which currently stands at 4.1% of Russia's GDP. Considering the level of expenditures of the leading countries in the ranking, it can be concluded that most countries, having a well-formed high-level education system, spend significant funds on maintaining it - from 4.6 to 8.7% of the country's GDP. Among the important components that form the qualitative cognitive characteristics of the country's human capital, one can also single out the level of development of scientific activity in the country. The participation of human resources in scientific activity contributes to the accumulation of quality human capital, the formation and implementation of creative abilities and the foundations of knowledge. As part of the study of the level of development of scientific activity in the countries of the world, we consider the level of R&D expenditures in% of countries' GDP. Thus, according to the UNESCO Institute for Statistics, among the countries with a relatively high level of investment in research and development, one can distinguish: Israel and the Republic of Korea (34.6%), Switzerland (3.4%), Sweden (3.3%) and Japan (3.2%). At the same time, when considering the absolute expression of these indicators, the list of leading countries varies markedly: the USA (543 billion US dollars), China (496), Japan (176), Germany (127) and the Republic of Korea (90). Among EU member states, a high level of investment has also recently been observed in Austria (3.2%) and Denmark (3.1%) [15].

The costs of Russia in investing in scientific activity in the country for 2018 are significantly small - 1.1% (the country is at 34th place in the ranking of countries in terms of funding). This trend can be called negative for the country and requires deep structural changes in order to create and maintain competitive human capital in the country. Thus, summarizing the above given data, it can be concluded that human capital is an important component of the resource provision of states, the level and quality of the existing country human capital depends on a number of factors, among which we can single out the quality of education in the country, the level of health care, the development of scientific activity, etc. ., the stability and condition of which directly depends on the effectiveness of the socio-economic policy of the states in question.

3. DISCUSSIONS

Human capital is a resource prone to changes under the influence of various kinds of factors, both economic and social orientation. Currently, among the differentiated factors that have a significant impact on the formation of this indicator, one can distinguish digital transformations of the world order. The digital transformation of the economic and social life of society has a direct impact on the change in the traditional human capital of both the country and the regions. The ubiquity of digitalization leads to the intellectualization of labor, the increase in the share of people employed in the service sector, to the modification of traditional forms of human capital, as well as the creation of new (network) forms [5]. Global digital technologies are being introduced increasingly into the everyday life of the population, so in 2019: the number of unique mobile users is 5.11 billion people (compared to 2018, the growth was 2%), the audience of Internet users increased by 366 million users and amounted to 4.39 billion people, the number of registered users on social networks increased by 9% and amounted to 3.48 billion people. The coverage area of 3G and subsequent generations is increasing every year - in North and South America, the Asia-Pacific region and Europe, the coverage area is more than 95% of the territories, in Arab countries - 91%, in the CIS - 88%, in Africa - 79%. The formation of modern competitive human capital involves the development of digital literacy of the population, which is complicated by differences in the cost of services of Internet providers and mobile operators - due to their high cost poor countries cannot obtain the necessary knowledge in the modern world - the gap between the population is already widening having digital skills (working on a computer, using email and digital gadgets) and far from them. In the future, these digital skills will not be enough for a comfortable existence in the digital environment - we are talking about the development of advanced digital competencies among the population. Among the countries that are actively introducing training among the population in technical disciplines that increase the level of digital literacy, the USA can be singled out under the slogan “computer science for all”. This trend has both positive and negative aspects for the population in the inter-country perspective. For example, increasing the level of digital literacy among the population contributes to the competitiveness of human capital of the host country, and the existing gap between the layers of the population will significantly rise, as well as the level of digital development of countries. This will increase social tension among residents. Changes are appearing in the production sphere, the level of business computerization is increasing in business processes, production robotics are growing, cloud communication with customers and suppliers is being introduced [4], the number of production operations using manual, mechanical labor is being reduced, all this leads to a decrease in demand for many professions, and in the long run to their disappearance. Specialists in the ICT field, engineers with developed digital skills and capable of constant self-training, are currently in first place in demand. According to another point of view, automation of production processes implies an increase in the production of modern equipment and robots, which can create additional jobs and, therefore, reduce the unemployment rate in the country.

Increasing the availability of high-speed Internet, increasing the level of provision of the population with computer equipment and digital gadgets, contributes to the development of new forms of employment, such as freelance - remote self-employment, which allows workers to earn income without reference to the workplace. In the United States, individual entrepreneurs account for more than one third of the total workforce; in India, more than 15 million specialists operate in the form of freelance. According to the geography of the freelance market, 35.4% of employees are in Europe, 28% in Asia, 21.2% in Latin America, 10.1% in Africa, 4.1% in North America and 1% in countries The Middle East. The global freelance market is showing annual growth on a global scale - in 2019, US freelancers' income increased by 79% compared to 2018, a significant increase in freelancer income is also observed in Britain (59%), Brazil (48%), Pakistan (47 %), Ukraine (36%), Philippines (35%), India (29%), Bangladesh (27%), Russia (20%), as well as Serbia (19%). The structure of the freelancers market also differs depending on the country of location - for example, the US freelancers market is represented by self-employed people of various ages, while the Asian market consists of people under 35% of the Asian market. The specialization of freelancers is quite diverse - from the IT industry to administrative and client support and law [12]. Nowadays, the digital transformations of modern society are one of the significant factors that have a significant impact on the formation of human capital of the countries of the world - the development and continuous improvement of technical and information support in the environment surrounding the population involves the formation of new capital requirements, among which are: development of workers' cognitive qualities, digital skills, the desire for continuous self-improvement and raising the level of existing knowledge; the widespread use of high-speed Internet contributes to the formation of new types of employment, such as freelancing, which allows using self-employment to reduce the territorial dependence of the employee, and also contributes to his self-realization, which also positively affects the qualitative characteristics of the country's human capital.

4. CONCLUSION

The digitalization of modern social life has brought significant changes to the structure of value guidelines in the world - the resources that are the fundamental components of capital give way to human capital, and physical strength to cognitive skills. The development of the popularity of studying, as well as the allocation of human capital to the category of strategic directions for the development of competitiveness of countries is directly related to the increasing importance of information, and, consequently, knowledge, the creation and dissemination of which are associated with the intensive work of effective professionals and competitive specialists. Human capital, like any kind of capital, has the ability to accumulate when affected by various kinds of factors, such as education, science, the level of quality of life, etc., and is also subjected to wear - moral and material. Depending on the conditions created for the population, the quality of the human capital of countries varies significantly. According to the analysis carried out in this researchwork, it was revealed that Norway has the highest level of human capital development among the countries of the world - a country with a high level of population safety, environmental quality, wages and education. The top ten countries also include countries such as Switzerland, Ireland, Germany, Hong Kong, Australia, Iceland, Sweden, Singapore and the Netherlands, which also have a high level of basic indicators of human capital development. The basis for the formation of the country's human capital is health and the level of education, therefore, without a high-quality and generally accessible healthcare and education system, the formation of highly competitive capital is not possible. In the ranking of countries by educational level, the leading places have such countries as: Germany, Australia, New Zealand, Denmark, Norway, Iceland, Ireland, the UK, Finland and Sweden, with a high level of education, with the availability of high-quality educational services, a developed scientific base,

allowing forming a competitive, aspiring to development, and intellectual capital of the state. This list of countries also presents the leaders in the world in terms of population health, where Spain took the leading place in 2019 - a study of the dynamics of the incidence rate within the country led to the conclusion that the quality of the physical components of human capital is influenced by the nutritional behavior of the population, as well as quality and accessibility health systems. The aspect of considering the scientific, educational bases and the healthcare system in Russia, we can make conclusions on the low efficiency of measures taken within the state to develop these areas, which significantly affects the level of human capital, as well as the growth of outflow of intellectual capital abroad. One of the primary factors influencing the formation of human capital in modern conditions is the digital transformation of the modern world, contributing to the emergence of new forms of employment, the predominance of cognitive skills on the physical, improving the living standards of the population. At the same time, the use of digital technologies also strengthens social stratification between countries due to the high cost of their use, which affects significantly low digital literacy rates among the population and the growth of social tension. We can say that high-quality competitive human capital contributes to the economic growth of the state in connection with an increase in the effectiveness of all types of activities, the development of innovative areas and the production of intellectual products, which, nowadays, helps to increase investor interest in investing in the economy. The formation of an effective state policy to improve the quality of life of the population, investment support of the spheres fundamental for the formation of capital, contributes to the economic growth of the country, increase its competitiveness, as well as create a high-level basis for innovative development.

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