

Human Capital Development in the Context of Globalization Processes: Regulatory Aspect

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ABSTRACT

The article defines human capital development components and their impact on the state's competitive development. The study aims to determine Ukraine's main human capital development directions in the conditions of post-war reconstruction. The study's relevance is determined by the deterioration of human capital usage in Ukraine due to the war with Russia. Therefore, it requires effective changes in the human capital development policy by the state, enterprises, and individuals. The developed methodology determines the study's novelty for analyzing the influencing factors on human capital. General scientific methods of cognition allowed us to identify the main elements of human capital impact. The correlation and regression analysis confirmed the hypothesis that human capital factors are population health, education, and information technology use. The analysis results show these indicators' high levels of influence on the state development in the global environment. The results of the study show that human capital has an impact on economic growth. In Ukraine, the development of professional skills of the population and the use of information technology in production processes positively impact the economy. On the other hand, the population's level of health negatively impacts economic development and requires health policy improvement. The discussion framework forms the development of human capital, considering the construction of public policy in this direction. The practical significance of the study lies in the possibility of its use in the process of developing a human capital development strategy at the state and enterprise levels.

HIGHLIGHTS

- ① The study's relevance is determined by the deterioration of human capital usage in Ukraine due to the war with Russia.
- ① The results of the study show that human capital has an impact on economic growth.
- ① The practical significance of the study lies in the possibility of its use in the process of developing a human capital development strategy at the state and enterprise levels.

Keywords: Human capital, innovations, education, health, ICT, war, COVID-19

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Understanding the growing importance of human capital in the modern world and its vast potential for economic development, scientists worldwide are actively researching this topic. Theoretical research and practice show that if the state manages human capital skillfully, it becomes an invisible force that can significantly accelerate economic processes. And vice versa, if the state does not promote human capital development, economic processes will be slow, the state will have no prospects to compete in the world market of goods and services, and therefore will always be dependent on other, more developed countries. Such a negative approach was observed in Soviet Union countries, where the state treated a person as a “productive resource”. Therefore, the development of a person as an individual, expanding their abilities and needs to turn them into a full-fledged economic agent, was not a government priority. That is why there was product homogeneity in the market, a noticeable gap in the quality characteristics of products, and non-competitiveness in prices (Ukrainian Institute of the Future, 2021). As a result, such an economy became incapacitated, which served as an excellent example of how not to build a state policy on human capital development.

Modern Ukraine is just on the way to reorienting its views on human capital development. Only some sectors of the economy and some enterprises understand that human resources are not a part of the established production process but serve as a force that can accelerate the enterprise’s development, bringing it to another level that can win in the world business market. However, today, in the conditions of war, the state and business need not just the restoration of human capital but its active development, which will rebuild the economy and bring it to a new level.

At the same time, it should be noted that human capital development is not only a state task. Each enterprise is independently responsible for the policy of using human resources. Therefore it can use them as a source of innovation and perceive employees with outdated personnel management standards.

The study aims to identify Ukraine’s leading human capital development directions in the post-war reconstruction.

To achieve this goal, the study should perform the following tasks:

- ♦ to carry out a critical analysis of scientific and special literature on the formation and use of human capital in Ukraine and the world;
- ♦ based on the systematization of statistical information to assess the general state of human capital use in the world to determine the directions of its development in Ukraine
- ♦ to find the main components of human capital development potential in Ukraine;
- ♦ to consider controversial aspects of human capital development in Ukraine.

Literature Review

Human capital today is an economical category widely studied in scientific literature. However, the concept is somewhat controversial, and accordingly, the value of human capital is measured by different scientists in different ways, according to their purpose and study objects. There is no single common opinion on the factors influencing human capital formation. For example, in the Ukrainian literature, some researchers (Tochilina, 2019; Grishnova, 2014) define human capital as a set of intangible assets that can be classified as the economic value of an employee’s experience and skills. It includes assets such as education, training, intelligence, skills, health, and other things employers value (loyalty, creativity, responsibility). That is, human capital is assessed by the skills in demand in the labor market. At the same time, in domestic works, human capital is often studied from the point of higher education development, general state of demographic indicators, population health, etc.

Analysis of foreign literature shows radically different approaches to the definition of human capital. In particular, it is associated with digital technologies, labor productivity, research, entrepreneurship, etc. For example, in some studies (Grigorescu *et al.* 2020; Novikova *et al.* 2020; Dubyna & Kozliancheko, 2019; Dovgal *et al.* 2021), human capital is determined by the work of the information services industry, where the concentration of human capital with the highest innovative skills is the largest. Other authors (Andrej *et al.* 2018) note a high concentration of human capital in the

financial sector. De la Fuente & Doménech (2006) found the impact of human capital on the economy through the correlation between GDP and labor productivity. At the same time, the authors note that labor productivity is a result of the innovative technologies applied in production processes, which is a consequence of the qualitative use of human capital. Other authors (Sofoluwe *et al.* 2013; Kalenuk & Kuznetsova, 2020) consider the development of human capital not through labor resources in production processes but through entrepreneurial activity. Entrepreneurship is an essential feature of the creative economy, where a person working in a competitive environment tries to create the best product, service, or service.

Issues regarding the legalization and movement of labor in key sectors of the economy that ensure sustainable development are given in the work Ksonzhyk Iryna, Lavrushchenko Yuliana, Oleksiuk Marcin, Saienko Volodymyr, Buryk Zoriana (2021).

It should be noted that the opinion of Ukrainian scientists on the development of human capital through the development of education is not unique. It finds support among foreign researchers. Some researchers have proved the interdependence between the volume of scientific research and the main indicators that indicate the nation's well-being (Sequiera, 2018). The concept of human capital development is formed by the understanding that people do not have the same skills or knowledge; their skill quality can be improved by investing in education (Jermolajeva & Znotiņa, 2013). For example, some studies show the importance of human capital to the economy. In this case, GDP is considered the leading economic target, and indicators of demographic status, in particular gender statistics, are considered to be the indicators that influence it (Hysa, 2018).

The scientists' opinion on the formation and use of human capital at different state levels is also worthy of attention: at the level of individuals, the level of the enterprise, and the level of the state. From this point of view, it can be concluded that human capital is a factor in labor price determination. It is because the concept of human capital admits that not all labor is equal, and therefore the expression of innovative work requires a more significant reward. Thus, human capital development should

start at the level of individuals who are aware of the importance of learning, practice, and improvement.

Human capital is an essential factor in enterprise profitability. Human capital contributes to increasing labor productivity and profitability, and competitiveness. Therefore, the more investments are made in the development of human capital, the more productive and profitable is human labor, human income, human needs as a consumer, and his role as an economic agent. Many studies (Link and Motivation Group; 2021) show that investing in the development of human capital by the enterprise allows for obtaining a reasonably high economic return. In particular, the Link and Motivation Group shows that investments in capital development have a good payback, and the ROI was about 34 % in 2021.

Human capital is a factor of economic growth; therefore, the skills acquired by the population have economic value. A skilled workforce can increase productivity, resulting in higher GDP. In addition, skilled labor can create new products that meet society's modern expectations, which leads to an increase in export potential.

Thus, the analysis of the scientific literature has shown the importance of human capital at different levels of the state: macroeconomic, microeconomic, and household levels. At the same time, human capital development is determined by approaches to understanding the components of this concept. Therefore, to find the right idea of human capital development, it is necessary to rely on the current state of human capital and the problems of human capital use faced by society in a clearly defined space and time.

The issue of labor migration in the context of sustainable development is being investigated: Koval, V., Mikhno, I., Udovychenko, I., Gordiichuk, Y., & Kalina, I. (2021); Oliinyk, O., Bilan, Y., Mishchuk, H., Akimov, O., & Vasa, L. (2021); Zinovieva, I.S., Artemchuk, V.O., Iatsyshyn, A. V., Popov, O.O., Kovach, V.O., Iatsyshyn, A.V., Radchenko, O.V. (2021).

Methods and Methodology

The methodology for assessing human capital in Ukraine is developed based on analysis, comparison, and synthesis of methods of various international

organizations involved in studying human capital. In particular, according to the reports of the World Economic Forum, the Global Human Capital Index is used, which evaluates 130 countries on how they develop their human capital on a scale from 0 (worst) to 100 (best). The main components of human capital are:

- ♦ potential – the level of education of young people and older generations;
- ♦ Implementation – implementation of acquired skills and their accumulation by the adult population;
- ♦ development – education, training, and retraining;
- ♦ know-how – the level of new skills used in work.

The World Bank uses its metric for assessing human capital. The Human Capital Index (HCI) measures the human capital that a child can expect from birth to 18, considering the country’s health and education systems’ risks. Overall, the HCI uses global estimates of the economic returns to education and health to create an integrated index that captures the expected productivity of a child born as a future employee. The benchmark of the index for all countries is 1. The main components of human capital are:

- ♦ probability of reaching the age of 5;
- ♦ years of productive schooling;
- ♦ harmonized test results;
- ♦ adult survival rate.

Therefore, the main components of the definition of human capital are demographic indicators, the state of innovative development, and the state of education.

In recent years, all countries have faced the problem of preserving the health of labor resources. For this reason, one more important indicator influencing human capital is the state of health of the country’s population. For Ukraine, the indicator of population health will be significant in the post-war reconstruction period, when a large number of men, who make up the majority of labor resources, labor, and intellectual potential after the war, will face problems of health recovery.

This is the basis for the study of the hypothesis that state development is influenced by the indicator of population health, information services, and educational level as the main components human capital concept.

To conduct an empirical study, a regression analysis was conducted with the determination of Pearson’s coefficient, which provides for the impact of health indicators, the use of information technology, and the availability of population knowledge and skills on the overall state of the country’s competitiveness. To carry out the regression analysis, a sample of the World Economic Forum report indicators was selected for the following countries: Ukraine, Poland, Slovakia, Turkey, Singapore, and Spain.

The methods of analysis and synthesis, comparison, induction, and deduction were also used in the study. In addition, specific methods include correlation and regression analysis, the results of which are the formula for the impact of the main indicators of human capital on the country’s overall development.

RESEARCH RESULTS

Table 1: Human Capital Index for Ukraine and some other countries

Country	Rank	Value
Singapore	1	0,88
Germany	11	0,79
UK	15	0,78
USA	24	0,76
Poland	30	0,75
Ukraine	50	0,64
Turkey	53	0,63
Moldova	75	0,58
Chad	157	0,29

Source: Link and Motivation Group (2021).

A number of indexes are used to assess the development of human capital. The Human Capital Index is the best known, which is regularly calculated by the World Bank (Table 1).

According to research, the human capital index in Ukraine is above average. However, to understand the dynamics and structure of the index, it should be analyzed by additional indicators (Table 2).

Table 2: HCI of Ukraine and selected countries

	Ukraine	Poland	Slovakia	Spain	Turkey	Singapore
HCI 2020	0,64	0,75	0,67	0,73	0,63	0,88
HCI 2010	0,63	0,71	0,67	0,71	0,62	0,84
Index components						
Probability of reaching the age of 5	0,99	1	0,99	1	0,99	1
Years of productive schooling	9,9	11,4	9,8	10,5	9,2	12,8
Harmonized test scores	478	530	485	507	478	575
Adult survival rate	0,81	0,89	0,9	0,95	0,91	0,95

Source: World Bank (2020).

Analysis of the components of human capital shows that the drivers for increasing the index are not so much the number of people as the quality of both health care and education. But the main thing is the dynamics, i. e., the systematic improvement of these indicators. At the same time, statistics show a somewhat outdated state of human capital development in 2020. If we study human capital in the context of Ukraine as of 2022, the most important indicator that will affect the human capital will be the number of labor resources, which is caused by migration, losses of the military and civilian population during the war, deterioration of the health of the working population.

According to the UN Refugee Agency, more than 9 million people crossed the border with Ukraine in mid-July 2022 (Murray, 2022). Most Ukrainian refugees are in Poland. As of 11 July 2022, more than 1.2 million Ukrainians fleeing the war were registered in the country (Gamaliy, 2022). Many people went to Germany, the Czech Republic, Turkey, Italy, Moldova, Romania, and Slovakia. According to the data of the analytical center of the international employment agency Gremi Personal concerning the Ministry of Family and Social Policy of the Republic of Poland, 372 thousand Ukrainian refugees have been employed in Poland since the beginning of the full-scale war (Melnychuk, 2022). It can be expected that the employed population will not return to Ukraine after the end of the war. However, most migrants, according to a survey by the UN Refugee Agency, wish to return to Ukraine (Gamaliy, 2022).

The forced evacuation of Ukrainian citizens caused the loss of human capital in Russia. According to various sources, Russian authorities have interrogated, detained, and forcibly deported

between 900,000 and 1.6 million Ukrainian citizens, including 260,000 children, from their homes to the Russian Federation (Blinken, 2022). The loss of human capital in Ukraine was caused by the killing many civilians and military personnel. According to the published data of the UN (2022), 11 152 cases of civilian deaths or injuries in Ukraine were recorded during the six months of the war: 4 889 dead and 6 263 wounded, which have already reduced the human capital in Ukraine. Aced reported over 10,000 deaths in Ukraine since the beginning of the Russian invasion (Gabershon *et al.* 2022). It is impossible to restore the pre-war labor potential in the short term, but the state can take measures to improve the population's health and stimulate its reproduction.

Significant changes during and after the war will take place in education. Not only working-age citizens but also students and pupils, who are the country's labor potential, continue to leave Ukraine. There are no clear statistics, but according to UN data, two-thirds of children and youth, including 5.7 million primary and school-age children and 1.5 million students, have been displaced by the war (Sovsun, 2022). Two sides can view the situation with pupils and students' departure. On the one hand, it opens access to free education in European countries, contributing to the formation of highly educated multicultural youth. On the other hand, a significant part of children and youth will not return to Ukraine. Thus, our state has lost a substantial amount of human capital.

Today, state policy in economic recovery is based on stimulating the development of digital technologies (Snigova, 2022). Information technology is one of the most promising sectors, which has a high innovative potential. During the lockdown and

Table 3: Baseline data for the analysis of the impact of human capital on the development of the country

Country	Rank 1/141				
	Health	Skills	ICT adoption	Competitiveness	Social Capital
Ukraine	101	44	76	85	109
Turkey	42	78	69	61	91
Spain	1	37	19	23	26
Slovak Republic	57	45	39	42	55
Singapore	1	19	5	1	15
Poland	54	34	51	37	70

Source: Schwab (2019).

war, this industry in Ukraine suffered the least losses, as it uses intellectual labor in its activities (Danylyshyn, 2022).

Given the above, we can conclude that education, health, and digital technologies are Ukraine’s main human capital development factors. To test the hypothesis about the impact of human capital on the state’s general state, we will conduct a correlation and regression analysis based on the initial data of the World Economic Forum Report.

According to the indicators, it can be concluded that Ukraine, even without the war, had a low health indicator (101), which lowered the overall competitiveness index of the state (since $101 > 85$). Instead, in Turkey, Spain, and Singapore, the health indicator positively impacts the state’s level of competitiveness.

Table 4: Results of regression statistics analysis of the influence factors on human capital

Indicator	Value
Multiple R	0,998
R Square	0,996
Adjusted R Square	0,990
Standard Error	3,718
Observations	6,000
Coefficients	Value
Intercept	7,62
X Variable 1	0,08
X Variable 2	-0,11
X Variable 3	1,27

The most positive impact on Ukraine’s competitiveness level is the population’s level of knowledge and skills ($44 < 85$). In addition, the level of information technology use is also a factor of positive impact on the overall level of competitiveness ($76 < 85$).

This fact again confirms the theory that the health indicator of the population will be the most important in the formation of human capital in the following periods.

The human capital formula can be defined as follows:

$$Y = 0.08 x_1 - 0.11x_2 + 1.27 x_3 + 7.62;$$

where y – indicator of social capital;

x_1 – indicator of the state of health of the population;

x_2 – indicator of the availability of skills and abilities gained from education;

x_3 – indicator of the use of information technology.

We can confirm the hypothesis that the main factors of influence on human capital are health, skills, and information technology, as $R^2 = 0.99$.

Table 5: Results of regression statistics analysis of the impact of factors on the development of the country

Indicator	Value
Multiple R	0,97090523
R Square	0,94265696
Adjusted R Square	0,8566424
Standard Error	11,0718148
Observations	6
Coefficients	Value
Intercept	-5,8
X Variable 1	0,4
X Variable 2	0,3
X Variable 3	0,4

Undoubtedly, human capital has a significant impact on the overall development of the country. This is confirmed by the high level of Pearson’s coefficient, which is $R^2 = 0.96$ and is defined as the

correlation between social capital indicators and the level of competitiveness. The influence of health, education, and information technology indicators on the country's overall development are also significant. According to the regression analysis, it can be seen that the relationship between the indicators is $R^2 = 0.94$.

It can be concluded that the general state of competitiveness of the state can be predicted based on the formula:

$$Y = 0.4 x_1 + 0.3 x_2 + 0.4 x_3 - 5.8;$$

where y – general indicator of the state competitiveness;

x_1 – indicator of the state of health of the population;

x_2 – indicator of the availability of skills and abilities gained from education;

x_3 – indicator of the use of information technology.

DISCUSSION

Thus, in general, the study results to some extent agree with the results of G. Becker (1964), who noted that the main source of state development is a sufficiently effective human resource. However, at the same time, there are many modern works of domestic and foreign researchers who have determined the impact of human capital on the development of the country by stimulating certain of its components.

Sharing the opinion of Kaleniuk & Kuznetsova (2020) based on the results of the study, it should be noted that human capital is the basis and driving force of economic development. At the same time, human capital is formed by the skills of the population and their ability to work (i. e., the indicator of skills and health).

It is worth noting that some researchers believe that education and health indicators are interrelated. In his study, Konstantiuk (2017) shows that the population with higher levels of education is characterized by better health and is more likely to lead a healthy lifestyle, which is reflected in lower mortality rates.

At the same time, Ukraine needs a more positive demographic outlook in the post-war recovery period. The basis of state policy in this direction is

significant investment in health care and mortality reduction, an active immigration policy that will bring back Ukrainians and attract workers from other countries to fill the gaps in the gender and age structure of the population (Guzman, 2022). But, despite the demographic losses due to the war, the problem of Covid-19 remains relevant, which also negatively affects not only public health, but also education. At the same time, mathematics education is particularly affected, which has a negative impact on the economy already now: factories and factories are experiencing a shortage of qualified engineering staff; workers who can count something (Repko, 2021).

Undoubtedly, additional investments in health care by the state will lead to improvement of its level, at least through better diagnostics and more effective treatment. Numerous studies have shown that investments in education also yield positive results for the economy (Jermolajeva & Znotiņa, 2013). Instead, the economic and mathematical study by Lebeda (2014) shows that the expenditures of the Consolidated Budget of Ukraine on professional and higher education do not have a positive impact on the development of innovation processes in the country, i.e. the results of economic and mathematical studies indicate that there is an imbalance in Ukraine between the high educational level of the population and the development of the economy on an innovative basis (Lebeda, 2014). There is a certain discrepancy between the high value of the indicator "Skills" and the low practical value of "Education", which indicates not a high level of quality of higher education in Ukraine, but a high motivational component of the population to self-education and development. This is exactly what state programs for human capital development should be aimed at - the creation of available non-formal educational programs, where the population will improve the practical skills necessary for the current labor market.

Due to self-education and a high motivation level, the information technology sector has developed rapidly in Ukraine. Many scientists believe that informatization is a tool for economic development not only in Ukraine but also in other European countries. Among the main economic development tasks is the growth of digitalization of material production, services and, in general, the entire socio-

economic and social life. At the same time, the use of information technology will make it possible to make a “digital jump” in various industries, which will significantly accelerate economic development (Dovgal et al. 2021; Dubyna & Kozliancheko, 2019; Novikova et al. 2020). The development of digital infrastructure will guarantee new jobs and improve the overall socio-economic situation in the country. But it is very important to transform the economy in a timely manner, when the market and external circumstances contribute to this development.

Thus, in the period of post-war recovery, the development of human capital should be based on three components: improving the health of the population, improving the level of education and developing information technology.

CONCLUSION

According to the results of the study, it can be concluded that human capital has a significant impact on economic development. At the same time, human capital development is a complex process that involves state measures to develop education, information technology and health. The current health of Ukraine’s workforce is poor and this is the biggest challenge for human capital development in the post-war recovery period. The state needs measures not only to formulate demographic policy, but also to revise the attitude to the financing of health care and medicine. Education also needs reforms as today graduates of higher education institutions do not have the skills necessary for innovative business. State programs for the development of education should be based on stimulating individual learning and practical skills required by the modern labor market. Developing digital technologies can have a positive impact on the economy and its rapid development, which is especially important in the post-war recovery process. The development of the state is influenced by many different factors, but the key ones are health, education and information technology, which is confirmed by the results of correlation analysis.

The practical significance of the study lies in the possibility of its use in building state strategies for human capital development.

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