

Impact of Global Digitalization on Public Policy in the Context of Education

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Abstract. The article is aimed to examine impact of digitalization on quality of life in the context of education. To achieve this goal, nine dimensions of quality of life and three components of the digital economy are analyzed. The research methodology is based on using the EU Statistics on Income and Living Conditions, which acts as the main tool, and UN statistics relating to the digital economy. In the course of the study, the theoretical model “Quality of Life – Digital Economy”, with the focus on the components of the potential of their interaction – education and innovation – is built. The results obtained show that the openness of interaction between individuals is possible due to digitalization, which has led to the creation of a new social stratum with IT skills. Moreover, the article highlights problems associated with digitalization, in particular, income inequality and education gap.

Keywords: global digitalization, digital economy, education, alternative labor, IT skills, publicity policy, public administration, European integration processes

1 Introduction

The digital economy involves interaction of the economy and society in the format combining the real and virtual world [1]. The introduction of digital technologies and the Internet are expanding opportunities for everyone in all spheres of life, regardless of social role and geographical location [2]. On the Internet, people can participate in commercial and non-commercial interaction with each other, using their skills for the benefit of the social progress of mankind [3]. The above mentioned combination will result in the destruction of traditional sectors and the need to adapt to new living conditions [4]. Thus, in the digital era, a new social stratum with IT skills appears (Bilynska M., Baltii Yuri, Boyarskyi Oleksandr, Bykova Tetiana Valerijivna, Gryshova Rymma., 2020)

- 1) The digital economy includes three components: 1) core: digital sector (digital platforms, mobile applications and payment services / digital products and services); 2) narrow scope: digital economy (digital services, platform economy); 3) broad scope: digitalized economy (e-business, e-commerce, Industry 4.0, precision agriculture, algorithmic economy) (Wadim Strielkowski, Gryshova I. Yu., 2018). The European Commission characterizes the digital economy as the main growth driver, encouraging competition, investment and innovation, which will lead to improved quality of services, expanding choices for consumers, creating new jobs [7]. At the same time, digitalization is considered as conditions for the diffusion of digital technologies, services, products, methods, skills across countries of the world. The expansion of opportunities for people sets new parameters for assessing quality of life, labor market, and human capital at the local / regional and national levels, which entails risks and destruction. In view of this, quality of life is assessed using a set of indicators reflecting its nine dimensions, which range from employment and human health to social relations, security and management (Azer Dilanchiev, Gryshova Inna, Rogach Svetlana, Diachenko Oleksii, Batrakova Tetyana, Shabatura Tatyana, 2020)

According to research of United Nations Development Programme (UNDP), in a digital economy, developing countries are more exposed to the risks of the digital transformation. The elimination of these risks requires a competent internal government policy aimed at providing equal Internet access for all categories of people and territories as well as ensuring an inclusive use of digital technologies for all age, education and gender groups (Gryshova, I.; Demchuk, N.; Koshkalda, I.; Stebliuk, N.; Volosova, N., 2019). Technologies are becoming an integral part of human life, and constantly open up new opportunities. Digital literacy allows people to combine digital and real life. Achieving a high level and quality of life in Industry 4.0 is possible with the formation of a highly developed national IT industry, with its products being effectively used in all spheres of life: from public administration to everyday activities of each member of society [10]. Thus, the use of information technologies (IT) suggests maintaining a balance between work, personal and social life.

In practice, a request arose to study technological trends in the digital economy and their impact on quality of life.

2 Materials and methods of research

At present, in carrying out international comparisons, there is neither universally accepted approach to the selection of indicators nor methods for assessing quality of life in a dominant digital economy. But there are rankings which measure quality of life in countries of the world, in particular: the Human Development Index, the World Happiness Report, the Inclusive Development Index, the Gender Inequality index, and the Multidimensional Poverty Index. However, in the context of globalization, IT and the Internet are radically changing all areas of society, creating both opportunities and risks [1]. It is the level of ICT development that is an indicator of a country's competitiveness in international community [10]. Today, according to the Organization for Economic Cooperation and Development (OECD), more than two-thirds of citizens use the Internet for e-mailing but less than one in ten – for online education. Moreover, a gap in employing digital technologies between individuals with high and low level of education is observed [2]. A group of

researchers – K. Rašič, M. Mulej, V. Čančer– conducted an empirical study concerning variables of quality of life indicators in the context of enhancing economic growth through technological research, innovation and knowledge. They proved that innovation has a positive effect on both economic growth and quality of life, but, to achieve this, it is necessary to develop the innovative component and promote knowledge [11]. In the study [12], scientists analyzed the development of the digital economy and proved that it has a significant impact on investment flows. The point for discussion, mainly in developing countries, is the existence of the discrepancy between the accelerating pace of digitization of the economy and education attainment, on the one hand, and the insufficient level of using ICTs by the population, on the other hand. Currently, there are no studies in the field of measuring impact of online platforms on quality of life, and effects of digitalization on the labor market in the context of earnings are still insufficiently investigated.

Thus, the *aim of study* is to examine the impact of digitalization on quality of life in the context of education.

In view of multidimensionality of the problem, the study employs an integral approach, as well as the methods of analysis and comparison, monitoring and reviewing of the latest trends concerning quality of life and digital technologies. The research methodology is based on using the EU Statistics on Income and Living Conditions, which acts as the main tool, and UN statistics relating to the digital economy.

The empirical base of the study is composed of international reports, in particular: Well-being in the Digital Age (2019), Digital Economy Report (2019), Global Human Capital Trends (Deloitte 2019); conference Higher School of Economics (Russia, 2019); statistical data of Eurostat, Organization for Economic Cooperation and Development (OECD), World Bank, UNDP, International Telecommunication Union (ITU), State Statistics Service of Ukraine.

3 Results and discussions

The analysis of recent studies in the field of digital economy and quality of life shows that the digital component is characterized by the following features: digital quality of life, availability of digital goods for the population, quality of working life and quality of social services in a digital economy [11; 13]. Thus, quality of life depends on the level of education required to take advantage of the opportunities offered by digital technologies. In view of this, there built a theoretical model of the interaction “quality of life – digital economy”, with an emphasis being made on a narrow scope of the digital economy (including digital platforms and services) and identifying components of potential of this interaction. By components of the potential, we mean objects that influence improvement of quality of life in a digital economy. The theoretical model includes nine indicators that measure quality of life in accordance with the Eurostat methodology and three components of the digital economy, according to UNDP global statistics. The proposed model focuses on the components of the potential – innovation and education, which enhance economic growth contributing to improvement in quality of life. The results of the study prove the impact of digitization on quality of life, which is reflected in the theoretical model (Fig.1).

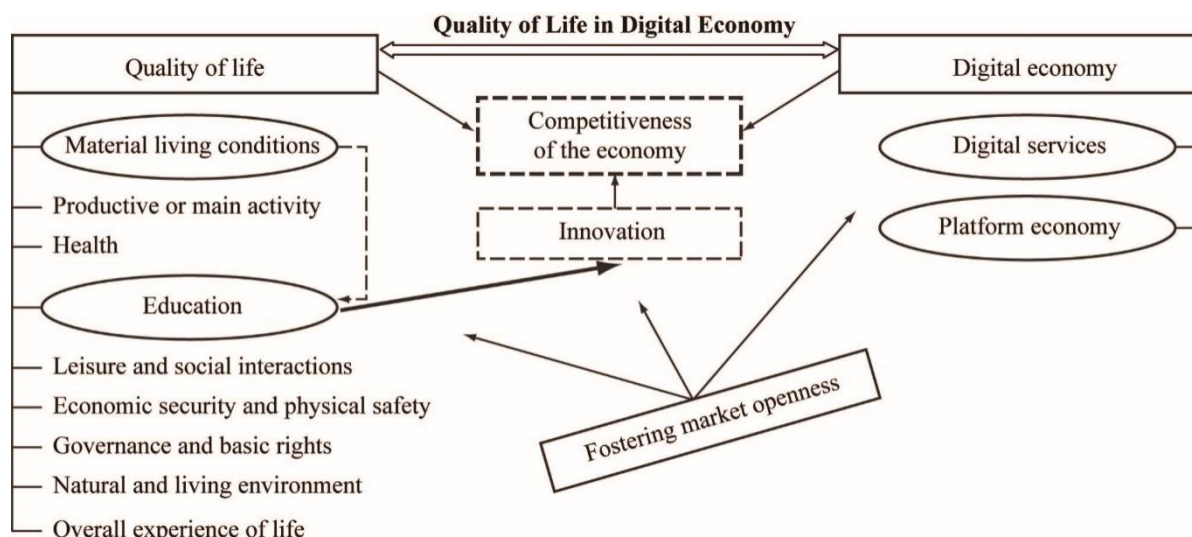


Fig. 1. Theoretical model “Quality of Life – Digital Economy”

Source: developed by the authors

Based on UNDP statistics on digital economy, it is possible to speak about improving quality of life due to digitalization if the country has built a high-quality digital infrastructure, which contributes to the creation of favorable conditions for the development of social capital and the potential of each individual [6]. Such conditions create a real opportunity for a qualitative improvement in people’s lives. According to Eurostat statistics, quality of life is measured by the following indicators which influence effective realization by a person of his/her skills in society for the progress of mankind (Kyzym M., Khaustova V., Reshetnyak O., Danko N., 2020):

- 1) material living conditions, which are characterized by material resources that form the well-being of an individual in accordance with his/her preferences and capabilities. The material standard of living should be considered as a combination of the consumption model of the Classification of Individual Consumption According to Purpose (COICOP), material deprivation, and housing conditions;
- 2) employment – quality of working life;
- 3) health, which affects individuals’ life span, characterizes the economic and social development of the country, human capital, and accessibility;
- 4) education – the main driver of technological innovation and high productivity as well as a means of transferring knowledge from generation to generation;
- 5) social engagement, which concerns social capital, both for an individual and society as a whole;
- 6) economic security and physical safety, which, at the individual level, includes the following types of threats: job loss, illness / aging; at the national level – financial crises and their consequences in the form of worsening economic conditions and falling living standards of vulnerable segments of the population;
- 7) social protection, which implies respect to human rights and the rule of law;
- 8) ecology, which reflects environmental conditions of the place of residence (pollution, dirt, noise);
- 9) life experience, which considers the choice, priorities and values of an individual.

At the same time, a characteristic feature of the digital economy is hyper-connectivity, which provides for the growth of interaction between people, organizations, and digital equipment due to IT, Internet and mobile communications services.

In the framework of the study of the relationship among the analyzed socio-economic indicators, there built a theoretical model “Quality of Life – Digital Economy” (Fig. 1), with the focus

on the components of the potential of their interaction – innovation and education, which enhance competitiveness. The model presents an attempt to integrate competitiveness indicators (innovation and education) with quality of life indicators and those used for measuring digital economy in open markets. The relationship between quality of life indicators (material resources, education) and the components of innovation and competitiveness is determined on the basis of empirical measurements in the field of modeling quality of life, using UNDP metadata on digital economy [6] and EU Statistics on Income and Living Conditions [14].

It is important to note that digital transformation provides people with the opportunity to control their economic and social life and improve their life quality, while destroying the old economic foundations.

In view of this, in 2019, the following figures confirming the increase in the alternative workforce across the world, were recorded (Tbl. 1). Alternative workforce includes contractors, freelancers, entirely outsourced teams, gig workers, as well as gig and crowdsourced employees.

Table 1. Using alternative labor beyond the IT function, % (2019)

Functional areas	Alternative labor is not used in this function	The use of alternative labor in this function is limited/rare	This labor type is used extensively in this function
Supply chain / procurement	62	27	11
Sales	62	26	12
Finance	56	32	13
Customer service	56	27	17
HR	53	36	11
Innovation / R&D	51	34	15
Marketing	49	36	15
Operations	42	33	25
IT	29	38	33

Source: [15]

If previously alternative arrangements were mainly used for IT, under conditions of digital transformation, they have extended to services, trade and education, as evidenced by results of the latest Global Human Capital Trends study. As shown in Table 1, the largest number of alternative workers was recorded for IT – 33 %, and the smallest – for Supply chain / procurement and HR – 11 %.

Educational attainment is the driver of innovation and productivity of the national economy. In Table 2, educational attainment (high, medium, low) in countries with different level of economic development, classified according to the World Bank Atlas method [16], are considered. In high-income countries – Poland, Germany, Sweden – the share of population (age group: 24-65) with high level of education is from 13.9 % to 31.7 %, medium – from 42.3 % to 60.9 %, and low – 7.4 % to 43.8 %. It can be argued that the population of high-income countries is dominated by people with secondary education. In upper middle-income countries – Bulgaria and Romania, this trend also persists. Ukraine, being a lower middle-income country, also has a similar stratification of the population, with people (age group: 21 and older) with a medium level of education accounting for 43.4 %. The difference between the share of the population with higher level of education and low level of education in high-income countries is from 16.3 to 29.9 times, in upper middle-income countries – from 2.8 to 10.6 times, in Ukraine (lower middle-income group) – 1.9 times [17-18].

Table 2. Educational attainment by country, 2018

Income group (based on the World Bank Atlas method)	Country	Level of education		
		High	Medium	Low
High-income	Poland	31.7	60.9	7.4
High-income	Germany	29.6	57.1	13.3
High-income	Sweden	13.9	42.3	43.8
Upper middle-income	Bulgaria	28.1	54.4	17.5
Upper middle income	Romania	21.1	60.6	18.3
Lower middle-income	Ukraine	27.3	43.4	29.2

Source: developed by the authors based on [18]

The OECD found that the level of using digital capabilities of the economy by the population is affected by a number of factors: 1) territorial accessibility; 2) income of the family; 2) availability of necessary skills in the field of online education[9].

According to the statistics for 2019, presented by the International Telecommunication Union (ITU), 4.1 billion people or 53 % of the world population use the Internet. In 2019, China took the 1st place in terms of the number of Internet users with 829 million of users, India was in the second place with 560 million of users, and the UnitedStates of America (USA) was the 3^d with 293 million of Internet users. This trend indicates that society is on the path to promoting digitalization across the world (Gryshova I., Kyzym M., Khaustova V., Korneev V., Kramarev H, 2020)

The number of Internet users is presented in Table 3. In 2017, (based on statistical data available), the largest number of users among the studied countries was recorded in Sweden, and the smallest – in Bulgaria.

Table 3. Internet access - households and individuals, 2017

Country	Adults aged 16-74 who used the Internet in the last12 months, %	Households with Internet access at home, %
Sweden	95.5	no data
Germany	84.4	no data
Country	Adults aged 16-74 who used the Internet in the last12 months, %	Households with Internet access at home, %
Bulgaria	63.4	67.3
Romania	63.7	76.5
Ukraine	65.2	59.8

Source: developed by the authors based on [19]

As part of the expansion of the digital economy and enhancement of the quality of life on a global scale, the governments of OECD member countries have proposed a program to combat poverty, with consideration for nine household deprivation (material deprivation) items, in different countries of the world, which envisages:

- enhancing access to communications infrastructures, services and data;
- increasing effective use of digital technologies and data;(IrynaKoshkalda,LiudmylaBezuhla,HalynaApelt,OlenaKovalova,ViktoriiiaSamsonova, 2020)
- unleashing data-driven and digital innovation;(Vinogradova, E., Nikoliuk, O., Galimova, A,2020)
- ensuring good jobs for all; (Haustova V., Omelchenko O, 2011)
- promoting social prosperity and inclusion(Gryshova, I.; Demchuk, N.; Koshkalda, I.; Stebliuk, N.; Volosova, N, 2019)

5 Conclusions

The results of studying the impact of digitalization on quality of life in the context of education show that digital technologies are a source of enhancing quality of life if the benefits of IT are used correctly by governments. It has been established that using the capabilities of digital technologies can contribute to increasing human, social and financial capital or result in creating a digital divide and inequality. Governments around the world should remove barriers to education, both for adults and young people, through implementing new online learning methods in combination with the traditional approach and ensure sufficient funding of lifelong learning. The COVID-19 outbreak had plunged the global economy into a crisis, resulting in accelerated digitalization of national economies. In this regard, the introduction of alternative labor programs with the main focus on using information technologies will help preserve jobs in the labor market and enhance competitiveness of the platform economy.

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