

QUALITY OF HIGHER EDUCATION AS A DRIVE FORCE OF INNOVATIVE RESOURCE IN THE DIGITAL ECONOMY

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In the article, the relationship between the quality of education, innovative resource and the pace of development of the digital economy was analyzed. It was determined that the main component of the system of innovative resource of the national economy is human capital. The level of education of which has a direct impact on the pace of formation of an innovative resource. In the digital economy, the creation and use of knowledge is becoming the leading force for development. Higher education was focused on achievements in the field of knowledge formation and has a significant impact on the pace of development of the digital economy. It was identified that the system of higher education in digital economies is at the same time a source of innovative knowledge, human capital, the basis for the development and promotion of innovations. The structure of the innovation resource of the national economy was analyzed and the main components are identified.

Key words: higher education, innovative resource, digital economy, human capital, knowledge, development

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STATEMENT OF THE PROBLEM IN GENERAL AND ITS CONNECTION WITH IMPORTANT SCIENTIFIC OR PRACTICAL TASKS

According to the Digital Economy Report 2021 United Nations Conference on Trade and Development [4] in 2022, global internet protocol (IP) traffic will exceed all internet traffic until 2016. The COVID-19 pandemic has impacted internet traffic due to remote work. Thus, in 2020, Internet bandwidth increased by 35%, which was the largest annual increase since 2013. The monthly volume of global data traffic is expected to increase from 230 exabytes in 2020 to 780 exabytes by 2026 [4].

At the present stage of world development, the understanding prevails that innovation is the main type of resource that is the driving force behind the formation and development of the digital economy. A shared drive for technological excellence, as the winner can gain economic and strategic advantage by controlling data and related technologies, especially in AI. Many experts argue that the fragmentation of the digital data economy will hinder scientific and technological progress, and will also lead to reduced competition, the emergence of an oligopolistic market structure in some countries and increased state influence in others [4]. Fragmentation will reduce opportunities for entrepreneurial activity, so how access for users and companies to supply chains will become more difficult, and the movement of data to other countries will be limited.

In the model of the circulation of income and expenses in the digital economy, the place of resource innovation and product innovation will be in the resource market and the product market, respectively. The resource and product essence of innovations are interconnected and flow into each other. In the reproduction process, innovation successively goes through the following stages: resource - factor of production - product - resource - improved initial resource (for example, improved technology). The main component of the innovative resource of any country is human capital as the main carrier and producer of innovative ideas. And it is easy to assume that the quality of education in this context is becoming one of the main factors influencing the formation of an innovative resource in the digital economy.

ANALYSIS OF LATEST RESEARCH AND PUBLICATIONS

The innovative resource of the national economy in the unity of its constituent parts as an object of study in the context of the digital economy arises quite rarely. The term "innovation as a resource" is more commonly used. At the present stage of development, the term innovation is interpreted in a broader sense, and there is no conceptual unity of research among scientists. In the context of the process approach, innovation is understood as a complex process that includes stages from development to consumption of innovations (P. Zavlina, L. Mindeli). When using an objective-utilitarian approach (A. Kuteinikov, R. Fatkhutdinov), in addition to considering innovation as an object, the emphasis is on its ability to satisfy social needs with a great "beneficial effect" [2]. The process-utilitarian approach (V. Gromeka, B. Santo) interprets innovation as a process and focuses on the economic effect. The Law of Ukraine "On Innovation Activities" defines innovations as "newly formed (applied) and (or) improved ompetitive technologies, products or services, as well as organizational and technical solutions of an industrial, administrative, commercial or other nature that significantly improve the structure and quality of production and (or) the

social sphere" [1]. Economic progress, world globalization, information revolution, digitalization have led to the fact that information has separated into an independent resource. The etymology of the study of this process was laid down in the 60-90s. XX century, when a large number of scientific papers appeared on the essence and content of the information resource, aspects of its use and influence on the level of development of national economies. Among foreign scientists dealing with these issues, one can single out L. Anchishkin, G. Gromov, O. Williamson, E. Denison, Yu. Denisov, V. Inozemtsev, Yu. Kanygin, M. Kastosov, A. Kolmogorov, T. Kravchenko, J. Kendrick, R. Coase, F. Knight, R. Nizhegorodtsev, V. Tambovtsev, K. Freeman, F. Hayek, M. Heidegger, T. Schulz [8, 9].

THE ARTICLE PURPOSES FORMULATION

determine the role of the quality of higher education in the system of innovative resource in the digital economy.

MAIN MATERIAL PRESENTING

The elements of the innovation resource are heterogeneous. Despite the fact that all of them are the result of the functioning of the human intellect, some of them exist in the form of knowledge that is not separated from the people who own them, while others create a kind of objective conditions for applying this knowledge to increase the competitiveness of the national economy. In this regard, two subsystems can be distinguished in the structure of an innovative resource as a system:

- 1) intellectual, embodied in employees in the form of their experience, knowledge, skills, abilities for innovation, as well as in the general culture, philosophy of the organization, its internal values;
- 2) information, including patents, licenses, trademarks, organizational structure, databases, electronic networks and other objective factors [6].

The main difference between these subsystems of an innovative resource is that the intellectual subsystem, being in the direct understanding of an imperceptible factor, inseparable and inalienable from those to whom it belongs, and cannot be copied or reproduced in any other organization, the information subsystem in as a whole or its individual elements, acquiring a real existence, can be copied, reproduced or alienated in favor of another organization or even an individual.

The division of the innovation resource as a system into intellectual and information subsystems is of fundamental importance for understanding the processes of formation of the innovation resource of the national economy.

We concretize the proposed structure of the innovation resource. Regarding the subsystem of the intellectual resource, it is mainly formed due to the scientific and technical potential of the country for the active use of human potential. The main element of this subsystem is scientific personnel, which include scientists, researchers, designers, experimenters, scientific and technical personnel.

This subsystem should be supplemented by inventors, developers and innovators who do not always belong to the scientific staff, but work in the production, trade and other sectors of the economy, engaging in non-systemic temporary scientific activities, solving current production, social, environmental and other problems. It should be noted here that it is this subsystem of the innovation resource of the national economy that has an impact on the formation of the country's intellectual potential due to the accumulated knowledge, skills and abilities of specialists.

As mentioned earlier, the formation of an innovative resource occurs due to scientific, technical and innovative activities in the country and is an integral part of the innovative potential and a form of realization of the scientific and technical potential of the national economy with the active involvement of human potential.

Human resource (capital, factor) is a component of the resource component of the innovation potential, which not only performs, duplicates the function of support, but acts as the main creative force. This is a set of invested socially expedient production and general human skills, knowledge, abilities that a person owns, are inseparable from him and are practically used in everyday life [9].

The human resource is at the forefront in the resource component of the country's innovative potential. Only its activation contributes to the recognition of innovations, their rapid dissemination and implementation.

Knowledge and information are factors that are specific in their nature and forms of participation in the production process. Knowledge, scientific information, when considered not as a substance implemented in production processes or means of production, but as a direct productive force, become a key factor in modern development. In sectors where knowledge is produced, information products, traditionally considered as sectors of the economy of the 4th-5th technological order, according to M. Porat,

become the primary sector in the information economy, which, according to P. Drucker, provides the economy with the most significant and important resource of production[5].

The expansion of knowledge as the main production resource is becoming a key feature of the public production of the digital economy. As a factor of production, knowledge has properties that fundamentally distinguish it from other factors of production. In particular, they contradictorily combine genuine infinity with top-level rarity, objective nature with unprecedented subjectivism, irreproducibility with replication, non-economic motivation for their acquisition causes obvious and quite economic consequences [6].

Knowledge, scientific information has always been used in production. However, today, when they occupy a dominant place in the organization of the modern national economy, the degree of their exclusivity becomes clear. The uniqueness of scientific knowledge as a production factor is due to the combination of prevalence and rarity contained in them, inexhaustibility and finiteness. None of the previously known, so to speak, traditional production conditions was distinguished by such a combination of relevant properties and characteristics.

The fact that scientific knowledge does not have such a property as rarity is due to several reasons. First, although scientific information produced in the conditions of commodity production may be an object of property, and as such, its dissemination may be limited and carried out under conditions determined by property rights to it, such restrictions are characteristic only for certain specific types of it and remain wide opportunities for dissemination of knowledge from which new knowledge is generated. At the same time, the very right of ownership of scientific information not only does not contradict the possibility of its maximum dissemination, but provides for the latter as a source of income for the owner of such a right.

Secondly, knowledge consumption is identical to the formation of new knowledge. As noted by R. Crawford, "knowledge expands and self-regulates... it grows with use. Thus, in the knowledge economy, the scarcity of resources is replaced by their abundance" [3]. In this context, it is obvious that the dissemination of scientific knowledge is identical to their self-accumulation, but excludes the application of the concept of rarity to this phenomenon.

Thirdly, such a characteristic as consumption in the traditional sense of this concept cannot be extended to scientific information. The use of scientific information leads to the emergence of new knowledge, without limiting the ability of other members of society to simultaneously use the same information for their own purposes, which, as W. Nicholson notes, is durable and retains value after use. can be used not only by the person developed by them, but also by those who have become familiar with the information in which they are embodied" [9].

Fourthly, the modern scientific and technological revolution has made scientific information the most easily replicated good, as the creation of an additional amount of which requires extremely low costs, which in most cases are carried out by the consumers of this good themselves. Given this, there is a point of view that scientific information has the property of a public good [347], when the latter is interpreted as something that a person can additionally use without increasing production costs" [24], and directly assumes that „s from a technical or conceptual point of view, nothing can measure the value of such goods in market terms" [8].

Statistical data on 153 countries "World development indicators" presented by the World Bank in the field of higher education demonstrate stable direct proportional relationships between the level and quality of higher education and the formation of an innovative resource of national economies [10].

So-called key and breakthrough innovations are the result of interdisciplinary research and development. In this context, the quality of higher education is of particular importance: the formation of competencies for the implementation of this kind of collaboration. The importance of higher education in the formation of an innovative resource is also evidenced by the European Innovation Scoreboard indicators: the share of the population with higher education, the share of the population participating in life-long learning, etc.[7]

Quality is a key parameter that determines the social significance of the education sector. The concept of quality, which includes the economic, social, cognitive and cultural aspects of education, is perceived as an integral characteristic of the results of educational activities; covers all the main functions and activities: the quality of staff, educational programs, student training, infrastructure.

Quality management of the educational process is a comprehensive, purposeful, coordinated process, the purpose of which is to achieve maximum compliance of current processes and results with the parameters defined by the standards, in particular, state educational standards in the areas and specialties of training specialists.

Harvey and Green understand the quality of higher education as:

- a special process aimed at a positive result at the "exit";
- the process of improvement within the educational process;
- compliance with the objectives, which means the fulfillment of the requests, requirements and expectations of consumers;
- the result of investments;
- transformations, denoting changes in improvement, provision of opportunities for students or in the development of new knowledge.

CONCLUSIONS FROM THIS RESEARCH AND PROSPECTS FOR FURTHER EXPLORATION IN THIS DIRECTION

The national economic development should be based on the use of scientific personnel, knowledge and innovation as the most essential components of the country's innovative resource. Economic development that is not based on a powerful innovative resource becomes limited and inefficient, unable to provide the necessary level of competitiveness of the national economy for a long period.

We determined that in the digital economy, the transition of the national economics to an innovation-oriented development path becomes the foundation for ensuring the country's innovative development. At the same time, the transition itself directly depends on the achieved level of the innovation resource, which is a "conceptual reflection of the phenomenon of innovation activity" [7].

According to the standards and recommendations, the main principles of external and internal quality assurance of higher education in the European space are:

- the responsibility of the organizers of higher education for the quality provided;
- use of transparent external expertise;
- encouraging the development of a quality culture in universities;
- taking into account and protecting the interests of society in relation to the quality and standards of higher education;
- continuous improvement of the quality of educational programs;
- demonstration by the university of quality both within the country and at the international level [7].

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ЯКІСТЬ ВИЩОЇ ОСВІТИ ЯК РУШІЙНА СИЛА ІННОВАЦІЙНОГО РЕСУРСУ ЦИФРОВОЇ ЕКОНОМІКИ

Наталія ТКАЛЕНКО
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У статті проаналізовано взаємозв'язок якості освіти, інноваційного ресурсу та темпів розвитку цифрової економіки. Визначено, що основною складовою системи інноваційного ресурсу національної економіки є людський капітал. Рівень освіти якого безпосередньо впливає на темпи формування інноваційного ресурсу. У цифровій економіці створення та використання знань стає провідною силою розвитку. Вища освіта була орієнтована на досягнення у сфері формування знань і має значний вплив на темпи розвитку цифрової економіки. Визначено, що система вищої освіти в цифрових економіках є водночас джерелом інноваційних знань, людського капіталу, основою для розвитку та просування інновацій. Проаналізовано структуру інноваційного ресурсу національної економіки та визначено основні складові.

Ключові слова: вища освіта, інноваційний ресурс, цифрова економіка, людський капітал, знання, розвиток