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INFLUENCE OF INNOVATIVE EDUCATIONAL TECHNOLOGIES ON THE FORMATION OF THE KNOWLEDGE ECONOMY

INFLUENCIA DE LAS TECNOLOGÍAS EDUCATIVAS INNOVADORAS EN LA FORMACIÓN DE LA ECONOMÍA DEL CONOCIMIENTO

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ABSTRACT

The study aims at analyzing the innovation activity of the Russian Federation as the main need for the formation and development of the knowledge economy. At present, the development of social and economic processes largely depends on the welfare of society and the observance of national interests, including technological and intellectual sovereignty. In this article, the authors have analyzed the key functions of innovation that affect the socio-technological development and formation of the knowledge economy. The socio-technological development and formation of the knowledge economy are based on interaction with the higher education system. The article emphasizes the role of educational innovations in the formation of the knowledge economy and determines the need to modernize the existing education system. The authors have concluded that the basis of the modern knowledge economy is high-quality education, which is assigned a priority role since it builds a new type of society in which the driving force of the economy should be the competition of knowledge.

Keywords:

Innovation infrastructure, knowledge economy, innovative knowledge, educational innovations, educational policy.

RESUMEN

El estudio tiene como objetivo analizar la actividad de innovación de la Federación Rusa como la principal necesidad para la formación y desarrollo de la economía del conocimiento. En la actualidad, el desarrollo de los procesos sociales y económicos depende en gran medida del bienestar de la sociedad y de la observancia de los intereses nacionales, incluida la soberanía tecnológica e intelectual. En este artículo, los autores han analizado las funciones clave de la innovación que inciden en el desarrollo sociotecnológico y la formación de la economía del conocimiento. El desarrollo sociotecnológico y la formación de la economía del conocimiento se basan en la interacción con el sistema de educación superior. El artículo enfatiza el papel de las innovaciones educativas en la formación de la economía del conocimiento y determina la necesidad de modernizar el sistema educativo existente. Los autores han concluido que la base de la moderna economía del conocimiento es la educación de calidad, a la que se le asigna un papel prioritario ya que construye un nuevo tipo de sociedad en la que el motor de la economía debe ser la competencia del conocimiento.

Palabras clave:

Infraestructura de innovación, economía del conocimiento, conocimiento innovador, innovaciones educativas, política educativa.

INTRODUCTION

Innovative activity and its effectiveness determine the key parameters for the development of social and economic processes at the national level, which is reflected in the Global Innovation Index (GGI). As of 2020, Russia ranked 47th among 113 countries in the GGI ranking. Weak sides of the development of innovation activity in Russia are the level of infrastructure development, the level of business and market development, and the development of technology and the knowledge economy based on the education system (Dzasezheva et al., 2023). In countries with developed market economies, the production of knowledge and high technology is the fundamental source of economic growth. According to the data, the level of innovation in the structure of Russia's GDP amounted to 6% in 2020, as it was 10 years ago (Sokolov, 2021). In industrialized countries, about 80-85% of GDP is provided by innovation and innovative activity.

The lack of effective innovation activity is the result of the technological lag of the Russian Federation from technological leaders in the international arena (Ramazanova et al., 2022). According to some indicators of development, the Russian economy lags behind not only the countries of Western Europe and the United States but also Latin America and Asia. According to the World Bank, the exports of high-tech products from Russia are six times lower than that of Thailand and 10 times lower than that of Switzerland. The Russian exports of high technologies are 3.7 of US exports and 4.3 of Japan's exports (World Bank Group, 2003).

These data indicate that the Russian economy is in dire need of innovations that can ensure its socio-economic development, technological independence, and competitiveness in the global market for innovative technologies and products. Therefore, the creation of an intellectual environment is a priority in the development of the knowledge economy (Avdeeva et al., 2022).

Thus, the role of educational innovations in the formation of the knowledge economy is emphasized, and the need for modernization of the mechanisms for their implementation is revealed. We highlighted the main directions of state participation in the formation of the knowledge economy in foreign countries. Special attention is paid to the state policy of the Russian Federation aimed at the development and state support of educational innovations.

The study aims at analyzing the role of innovation as the key need in the formation and development of the knowledge economy based on educational activities.

METHODOLOGY

This article is analytical; therefore, it consists in considering (systemic and comparative analysis) and comparing scientific theories and approaches to the study of innovations and features and patterns of innovative activity, which is reflected in a series of continuous transformations of socially significant processes at all levels of social organization (enterprise, state, world economy).

Innovations and related phenomena (the birth of an innovative idea and innovative knowledge, the formation and development of innovative thinking, innovative activity of enterprises and organizations, innovative product and marketing of new products and markets, the viability of competitive advantages, the formation of the knowledge economy, etc.) are the research subject of many modern sciences, including politics, economics, management, engineering, sociology, psychology, cybernetics, etc (Manuylenko et al., 2022).

This study aims at substantiating the thesis that innovation is a social need. At the macro level, it is the global source of developing human civilization. At the micro level, it is the source of developing the competitive advantages of each enterprise. In addition, any social need not only determines the current needs of society but also performs certain functions. It is a kind of communication between society and the external environment. Within the framework of this study, we identified and analyzed the key functions of innovation that it performs for socio-technological development and the formation of the knowledge economy.

DEVELOPMENT

Many modern sciences use the term "need" since the current development of any scientific field is characterized by humanistic and social orientation, which is achieved through the satisfaction of social needs (industrial and personal). Each scientific field that uses this term defines it from the standpoint of scientific priorities. From the viewpoint of economics and management, there is a classic definition of wants given by Kotler (1990), "**wants are a form that a human need takes as shaped by culture and individual personality**" (p. 22). Under this definition, human needs since a person is the main consumer of material and non-material goods are formed and transformed under the influence of social institutions and social forces (the cultural level). The satisfaction of needs through the consumption of products underlies the emergence and development of production and production technologies.

The current development of society is characterized by scientific and technological achievements and the

knowledge economy. It also realizes the possibility of mass production of various goods to meet the needs of consumers. This process is accompanied by a feature significant for both society and the economy: a decrease in socially significant costs for their production (manufacturing). The logical sequence of scientific and technological progress leads to the creation of innovative (fundamentally new) technologies and products, as well as the improvement (reorganization, restructuring, modernization, modification, etc.) of existing ones. In addition, this has served as a source of accelerating the process of updating the technologies used and products manufactured. Innovation contributes to the emergence of new ways to satisfy the same need with different types of products. It also becomes possible to satisfy different needs with one type of product. Modern society satisfies social needs (industrial and personal) through two methods:

- The extensive expansion of already mastered technologies and products;
- The creation of effective innovations, as well as the growing range and scale of innovations in the economy.

Modern society and economy define the second method to meet needs as the most efficient and rational in terms of achieving social and economic benefits. In this context, innovations are regarded as the result of innovative activity.

Innovation as a need performs several socially significant functions that contribute to the satisfaction of social needs and socio-technological development, hence evolution (Figure 1).

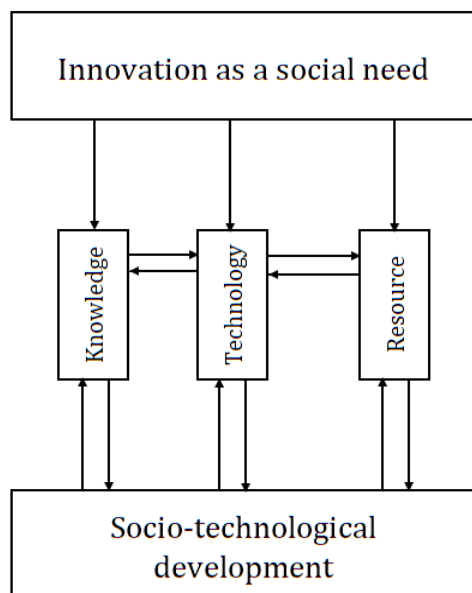


Figure 1. Innovation as a social need.

The basis of any high-tech production or product is new innovative knowledge that results in this production (technology) or product. In this case, innovations meet the need for innovative knowledge. Knowledge is the core of scientific and technological progress and evolutionary development (Malyuga & Petrosyan, 2022). The transfer of knowledge from one scientific field (special) to another (for example, related) is often behind the emergence of new innovative knowledge. The process of transferring and adapting knowledge to another scientific or professional field is always distorted, which can also be the source of innovative knowledge and innovation (Semenova et al., 2018) (Figure 2).

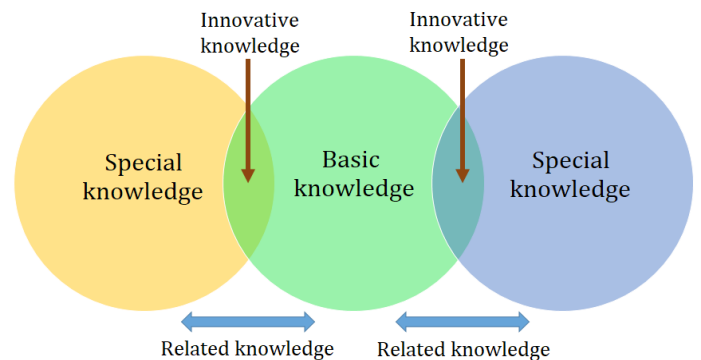


Figure 2. The integration of knowledge into the related fields and the emergence of innovative knowledge.

“The growth of technological and scientific knowledge over the past two centuries has been the most important and dynamic element in the economic and social history of the world. We now live in the era of the knowledge-based economy” (Coughlan et al., 2010). The transformation of knowledge is the basis of the knowledge economy. In addition, it becomes a continuous process realized through the emergence of innovative technologies, the formation and development of new markets, and the creation of new social institutions and organizations. The production of advanced (innovative) knowledge in science and technology is a fundamental factor in the development of modern society.

Consequently, innovative knowledge transforming into innovative technology performs the function of innovation as a technology (Figure 1). However, not the knowledge itself is significant and valuable for the information society and the knowledge economy, including natural science knowledge (Snabe et al., 2009). Knowledge-on-demand necessary for development is transformed into efficient (flexible) innovative production and marketing of new consumer products. Later innovative knowledge acquires an economic value. The speed and scale of transforming knowledge into innovation and innovative technologies

determine the dynamic development of the main socially significant processes. The transformation of innovative knowledge into technology determines and satisfies another urgent social need of modern society, i.e. innovation as a need for technology (Figure 1).

In the context of forming the knowledge economy, competitive advantages that ensure the viability of an enterprise (organization) largely depend on its ability to create, produce, and use innovative (new) knowledge, as well as bring innovations to the market. This makes competition more unpredictable as a competitive advantage is driven by innovation and flexibility to adapt to market demands rather than efficiency as it was before. From this viewpoint, innovation becomes a resource that ensures the viability and feasibility of many enterprises and entire economies (Figure 1). The formation and promotion of innovation are due to innovative progress in the knowledge used to create an innovative product (technologies and goods), which contributes to the emergence and formation of new markets.

Innovations ensure feasibility and enhance competition in the market, creating conditions in which enterprises cannot survive on efficiency by producing more products of the same type (European Commission et al., 2008), i.e. extensive expansion does not bring competitive advantages and viability in perspective. To maintain their viability, enterprises must focus their efforts on creating innovations that allow them to produce not the same but different goods (innovation). This creates a demand for knowledge-intensive production, which stipulates the formation of the knowledge economy. Innovations for enterprises and the economy as a whole act as a resource that ensures their survival today and in the future since innovations are an opportunity for development (improvement, transformation, modernization, etc.) and the possibility of new knowledge (new innovations).

Civilization is defined as a social movement that ensures its stability and ability for self-development through the self-regulation of exchange with the environment (Wikimedia Foundation, 2003). In relation to human society, a social movement is determined by development caused by scientific and technological progress. Thus, the development of human civilization is a series of scientific and technological results (achievements) aimed at meeting the needs of society through the introduction and adaptation of innovations based on advanced (progressive) knowledge. From this viewpoint, innovation is a social need that determines not only the modern technical, economic, and socio-humanistic development of society (micro level) but also the evolution of civilization (macro level or post-industrial stage) (Melikhov et al., 2022). Innovation ensures not

only the development of modern society but also the formation of new needs and paradigms, the transformation of social institutions and values, and the formation of new opportunities for their implementation in the future.

The scientific and technological progress determined by the development of information and digital technologies, as well as the knowledge economy, is based on innovations that condition the vector of development of all socially significant processes and in all spheres of life of a modern person, which conditions the need for innovations as a global need of humankind ensuring the evolution of civilization. Russian society is in sore need of innovations since not only the national economy and quality of life depend on their effectiveness but also the technological and intellectual independence of the state. The main achievement criterion of the latter is breakthrough innovative technologies in strategic areas. Thus, the modern knowledge economy is based on education. The latter should be assigned a priority role as it becomes the basis for building a new type of society.

CONCLUSIONS

At this stage of social development, innovation plays a key role in the development of both socially significant processes and the technological sphere. For the formation of the knowledge economy based on innovative knowledge and its transformation into technology, innovation is a need that not only ensures development but also sets its vector for an enterprise, state, and civilization as a whole, creating new opportunities and providing the necessary resources for further development. Therefore, the creation of an intellectual environment should become a priority in the development of the knowledge economy.

The current development of the economy makes almost every enterprise and organization join, develop and support innovative activities by training their employees and introducing innovations and innovative technologies.

The constant social need for innovation is determined by an ever-changing external environment and the threat of obsolete knowledge, products, and technologies, which will lead to a loss of competitiveness and undermine the existence of enterprises and economies that do not care about their future (European Commission et al., 2008). Thus, we concluded that state support of educational innovations should become a priority for the development of economic policy through the innovative entrepreneurship of universities and the expansion of innovative infrastructure (technology parks, business incubators, etc.).

While analyzing the key functions that innovation performs as a need that ensures development, we identified not

only the functions themselves but also the logical relationships between them. This will contribute to more efficient construction of innovative activity with due regard to the flexibility of performing all the functions that innovation performs as a social need.

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