KNOWLEDGE AND INNOVATION AS KEY DRIVERS OF CRASTER-NETWORK DEVELOPMENT OF THE REGIONS AND COUNTRIES IN THE CONDITIONS OF DIGITALIZATION

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Abstract. World processes associated with the transition to a new stage of economic development called the "new economy", "knowledge economy", are characterized by a high level of innovative activity, which is manifested in the introduction of new knowledge and innovative technologies. Regional economies in the context of cluster-network development and the emergence of digital technologies impose new requirements on people who must possess digital competencies and improve their knowledge continuously, throughout their lives. In this regard, the role of educational technologies offered on the market is increasing and making it possible to continuously study on a distance basis using e-learning opportunities. The article substantiates the thesis that innovations and knowledge affect the cluster-network development of regions and countries; for the constant replenishment and renewal of knowledge, the expediency of using e-learning opportunities throughout life is substantiated. The statistical data of the TOP-25 developed countries according to the level of the Global Innovative Index (GII) (2018) are presented, as well as some other indicators related to it, namely: knowledge absorption, the state of cluster development, and knowledge technology output.

Keywords: innovation, knowledge management, clusters, cluster-network structures, digitalization, e-learning, Global Innovation Index.

Introduction

Today, almost all world economies are interested in moving to an innovative path of development. This is due to the increased demand for innovations - new knowledge and original technological solutions [1,21,29]. The objective needs to take into account the innovation factor is becoming a decisive condition for the further development of the modern economy. A long-term statement of the fact that economic growth in the region can be achieved only on an innovative basis with the active use of modern scientific and innovative developments, should move on to real action.

However, the arrival of new technologies is not supported by the creation of new, progressive paradigms in education. Technologies make it possible to access new information, but, on the other hand, exacerbate the problem of specialized and

regional-sectoral imbalance in the training of highly qualified specialists. Moreover, this problem is aggravating at a very fast pace [26].
Knowledge management is not only database management, not administrative regulation, it is, first of all, the management of people who are united by a common regional economic problem, generate ideas, develop development models, and are able to effectively act towards the progressive implementation of changes [14,15,19]. The driver of development, the source of growth and prosperity, as well as the factor determining the competitiveness of enterprises, countries, and regions, is the creation, use, and effective exchange of knowledge. The knowledge economy is a type of economic development in which the development of science and education, as well as other knowledge-intensive industries and services, is predominant.

An important condition for building an innovative economy is the modernization of the educational system. To ensure innovative growth, a transition to a “knowledge society” and a knowledge-based economy is necessary [18,26]. In addition, global competition is now intensifying, including the competition of education systems, which encourages continuous improvement of technologies, the introduction of innovations, and rapid adaptation to the dynamically changing conditions of our time [22]. In addition, there is another serious problem that is relevant for Russia as well - the inconsistency of the level of professional training of specialists with the social order and the requirements of employers [16]. Also, getting a quality education is included in the range of value orientations of citizens. All these, in some places not related to each other, problems caused by digital transformations [12], modern scientists have found the most optimal solution - the creation of educational clusters and cluster-network associations [13].

Method and Methodology

The main research method is the comparative method, which makes it possible to provide a reasoned substantiation of the author's thesis about the interrelation and mutual influence of knowledge and innovation on the clustered development of regions and countries.

Results

The functioning of the cluster-network model of the region depends on many factors: the creation of an intersectoral, intersectoral, and interdepartmental system of public administration and business structures; development of multichannel resource supply; creation of a unified information system; training of professional leaders with knowledge of strategic management, etc. According to N. Smorodinskaya, firstly, the drivers of economic growth of clusters are the effects of knowledge overflow or externalities that arise not only within industries (Marshall externalities inherent in traditional agglomerations) but also between related industries (Jacobian externalities, generating diversification of production), represented in clusters [30]. At the same time, the effects of the overflow of tacit knowledge (tacit knowledge) circulating within the partnership network, in particular between the cluster members (what Marshall called a "special atmosphere"), are of particular importance. Secondly, innovations require a systematic approach, that is, the presence of a system of network connections of agents for the joint creation and distribution of innovations [30].
The intellectualization of the economy through the creation, use, and distribution of new knowledge becomes the basis for the development of society, since “unlike traditional resources, information and knowledge are not depleted in the process of use and, included in the production system, have a much greater value than outside it” [8]. Under these conditions, clustering processes play a significant role [32], as evidenced by the data given in Table 1.

Many modern researchers agree that knowledge plays an important role in generating innovations, which, in turn, are the drivers of cluster-network development of regions and countries in general [4,5,9,10,25,31]. At the same time, knowledge management acquires not only regional but also national significance [22]. The data in Table 1 show that there is a certain (albeit indirect) relationship between the innovativeness of a region (country), and the development of clusters, although without conducting a special study that goes beyond the scope of this article, it is impossible to accurately establish the nature and closeness of this relationship.

As I. Nonaka and H. Takeuchi argue, when organizations innovate, they do more than simply process information from external sources to solve existing problems and adapt to a changing environment; organizations on their own create new knowledge and information necessary to develop a new approach to both problems and their solution, and as a result - to change the organizational environment [2] and, ultimately, create a favorable educational environment.

Table 1 - Indices of innovativeness and clustering (2018)

Country	Global Innovative Index (2018)		State of Cluster Development		Knowledge absorption		Knowledge Technology Output	
Switzerland	68.4	1	68.6	11	53.3	9	74.9	1
Netherlands	63.3	2	73.4	4	77.9	1	63.7	2
Sweden	63.1	3	67.4	15	49.4	14	60.1	3
UK	60.1	4	72.6	5	42.4	24	48.2	13
Singapore	59.8	5	69.6	9	72.4	2	51.3	11
USA	59.8	6	78.4	1	53.8	7	55.6	6
Finland	59.6	7	67.0	16	48.8	15	53.5	8
Denmark	58.4	8	61.3	22	41.0	26	46.9	15
Germany	58.0	9	73.9	3	42.6	22	52.2	10
Ireland	57.2	10	62.7	19	53.8	6	56.6	4
Israel	56.8	11	57.0	31	52.9	10	54.8	7
Korea (Rep)	56.6	12	59.6	27	48.2	16	53.3	9
Japan	55.0	13	69.1	10	53.3	8	48.6	12
Hong Kong (China)	54.6	14	72.4	6	56.7	3	36.7	26
Luxembourg	54.5	15	67.5	13	51.8	11	47.9	14
France	54.4	16	61.4	20	47.0	17	41.6	19
China	53.1	17	59.6	26	51.7	12	56.5	5
Canada	53.0	18	60.4	23	42.5	23	39.5	22
Norway	52.6	19	67.4	14	36.3	38	37.6	25
Australia	52.0	20	49.7	49	33.8	46	31.9	38
Austria	51.3	21	65.7	17	42.8	21	34.3	32
New Zealand	51.3	22	51.4	43	37.5	36	32.1	37
Island	51.2	23	51.6	42	34.6	42	35.2	30
Estonia	50.5	24	45.5	68	35.6	39	35.9	29
Belgium	50.5	25	63.7	18	39.1	30	40.2	20
…	…	…	…	…	…	…	…	…
Russian Federation	37.9	46	42.3	79	38.1	35	28.9	47

Source: *Global Innovation Index 2018*.
https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2018-appendix1.pdf

The educational environment as a system arises remains and develops where there is a need for the exchange of knowledge between its subjects. Under the influence of objectively forming environmental factors that require updating existing knowledge, an imbalance of the educational environment arises, which inevitably leads to an asymmetry of all its components, the formation of new goals, educational

content, methods, and forms of education, predicted results of educational activities and the resources available for this: human resources. , financial, scientific, informational, and others.
The result of the mismatch is the search for new educational technologies, resources, reserves of innovative development, which, in turn, lead to the discovery of new ways to radically change the educational environment. There is a public need for new knowledge, competencies, skills to act for all subjects of the educational environment [6], as well as the need for educational programs of lifelong education for adults ("lifelong learning") using e-learning [17,23].

An important component of the process of generation, use, reproduction, and distribution of new knowledge is knowledge transfer, the essence of which is the transfer between various organizational structures and knowledge processes, which are not only the initial data, but also the end result of the innovation process, where external knowledge is combined with internal ones. accumulated in the course of previous innovation processes, including technologies, experience, and skills, are transferred from one side to the other, leading to innovations in the economy and social sphere [24].

The above processes of creation, use, reproduction, and transfer of knowledge, aimed at increasing the level of socio-economic and innovative development of regions, can be defined as knowledge management. At the same time, collective knowledge is based on individual knowledge, therefore, the knowledge management process should affect each person, because it is the person who is the main value, because thanks to his knowledge and interaction in the team he can provide the competitive advantages of any enterprise [27]. Thus, the management of innovative knowledge is the basis for the development of business entities, regions, and the country [22]. The new knowledge gained at the regional level is transformed into competencies, which are manifested in the creation of innovative products, processes, and technologies, thereby ensuring an increase in the competitiveness of these entities. In the context of the above, the cluster approach is viewed as a promising direction for the innovative development of the regional economy [3, 7, 11, 20].

Conclusion

Knowledge, as a resource, in the knowledge economy, is an endless source. The main bearer of knowledge is an educated person. Therefore, the information environment should provide a significant increase in the aggregate knowledge in society, the development of human capital. This predetermines the free exchange of knowledge and active consumption of knowledge, especially in the educational environment]. The knowledge economy is inextricably linked with a constant cycle of innovative development. The ability to create new knowledge, technologies, processes, the ability to access new knowledge, and the possibility of its effective commercial use are all fundamental elements of competitiveness, both at the regional and global levels. Innovation is the main form of translating knowledge into wealth and is a key characteristic of the knowledge economy. As studies by economists show, innovation today is the main source of economic growth and the most important factor in the competitiveness of enterprises, regions, and national economies. The development and implementation of innovations are closely linked with the creation, assimilation, and application of knowledge, that is, innovation and knowledge are a single whole, which cannot be divided in principle. The ability to perceive knowledge is, first of all, the ability and ability to learn, and, therefore, to assimilate and use the acquired knowledge in practice.

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