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INTEGRATION OF HIGHER EDUCATION AND DIGITAL ECONOMY DEVELOPMENT

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Abstract

In this article, the authors examined the problem and possible ways of integration and adaptation of the higher education system to modern economic realities. The aspects of the higher education system that are affected by the process of formation and development of the digital economy are revealed. Due to the fact that the effectiveness of education is largely determined by the demand for graduates in the labor market, the authors studied the requirements of employers (business structures) for specialists in the digital economy. Based on these requirements, the authors identified key areas of transformation of the higher education system, aimed at the formation of the competencies needed by specialists at present. New requirements force universities, firstly, to form new educational programs focused on the issue of IT specialists, and secondly, to build a new way of learning and mastering the IT competencies of graduates who study programs oriented to traditional industries, such as light industry, heavy industry, mechanical engineering, woodworking industry, etc. A comparison of traditional and modern concepts of higher education was held. The authors have identified the problem of discrepancy in the pace of development of business structures and universities. Therefore, as one of the areas of adaptation of the higher education system to the digital economy is the continuous interaction of universities with business. Such cooperation is based on such development vectors as: training, innovation, research, information, etc.

Keywords: Digital economy, higher education, technological order.

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1. Introduction

In recent years, in connection with the processes of digitalization of the economy, based on new technologies in the field of IT, there has been a significant change in the economic paradigm of economic entities. The support of the digital economy program at the state level indicates the undoubted relevance of this topic for Russia. In the existing realities, there was a question of stimulating the population and companies to move as quickly as possible into the digital economy. These trends determine the need for timely public education on the digital transformation of the economy.

At the present stage of improving the current, medium and long-term development of higher education, synchronization of higher education and the national economy is carried out by bringing them to a single direction of development, which unites targets for increasing the growth rate of gross domestic product, the quality of services provided.

The need to ensure the integration of the activities of organizations of higher education and improve the economic and social performance of the national economy is evidenced by the basic provisions of the Digital Economy of the Russian Federation Program (Digital Economy of the Russian Federation Program, 2017). The program is focused on achieving goals in the conditions of the formation of a digital economy, consisting in the transition to a new technological mode of development.

Adaptation of the educational process to new conditions and challenges of the future will minimize the possible increase in unemployment, as well as provide the necessary human resources to the developing areas of the Russian digital economy.

2. Problem Statement

According to the concept of cyclical development of the economy, in different countries at different times the technology inherent in different technological structures can dominate – a set of production methods characteristic of a given level of development of productive forces.

Currently, economists identify five technological orders, and predict the offensive of the sixth, which is based on information technology.

Digital economy is understood as a system of economic, social and cultural relations based on the use of digital technologies.

The formation and development of the digital economy leads to radical changes and increased uncertainty in various sectors of the economy. Changes are associated with the emergence of new technologies and the speed of their spread in traditional industries, as well as with the emergence of new fields of human activity.

At the same time, “Digital Economy of the Russian Federation Program” defines the dominant place of information and telecommunication technologies in various spheres of the national economy. These technologies are used not only as a source of obtaining the necessary information, but also as a way of storing and processing them, as well as the possibility of creating the necessary platforms and services. Obtaining the necessary information in the new technological structure becomes the main asset due to their alternative value, used to implement new organizational and technological ideas, to achieve the set targets and socio-economic development.

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According to statistics from McKinsey company, the share of the digital economy in Russia's GDP according to data for 2017 is 3.9%. The similar indicator of the countries leading in economic and technological development (USA, Japan, Singapore, Israel) is almost twice as high. However, the positive trend is that the volume of this market in Russia is constantly growing (Russia Today. Site "Social Browser" MIA., n.d.).

One of the sections of the Program includes the problem of the availability and development of personnel. In February 2018, the Government of the Russian Federation approved the Road Map of the Personnel and Education direction of the Digital Economy of the Russian Federation Program. The document stresses the importance of the time factor in the digital economy and suggests developing forms of accelerated education aimed at meeting the modern economy's personnel needs. The development of a basic model and a list of key competencies in the digital economy, a personal competency profile and a human development trajectory, and an increase in the number of students in IT areas are envisaged.

Due to the fact that the key factor in the new (sixth) technological order is information technologies, and an increase in the share of mental labor and the use of a creative approach to solving production problems are expected, it is necessary to update the sphere of educational services in terms of ensuring the widespread use of information and telecommunication technologies, new teaching methods and tools, as well as achieving the continuity of the educational process.

3. Research Questions

The disclosure of the above stated problems generates the search for answers to the following questions:

- What skills does a graduate of a high school need to have during the digital transformation period?
- What aspects of the universities activities will undergo changes in the course of digitalization of higher education?
- What are the partnerships "entrepreneurial structure – higher education institution", what is their specificity in the era of the digital economy?
- Observance of what conditions should be accompanied by the training of specialists in the field of information and telecommunication technologies for the development of the digital economy.

4. Purpose of the Study

The purpose of the article is to study the problem of integration and adaptation of the higher education system to the modern conditions of digitalization of the economy and identifying possible ways to solve it.

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5. Research Methods

The research is based on an interdisciplinary approach using the methods of logical-structural, situational and comparative analysis. The conclusions and recommendations obtained during the writing of the article can serve as a basis for the further development of economics (for example, the theory of interaction between economic entities) and the improvement of the higher education system in modern conditions of digitalization of the economy.

6. Findings

The training system for the digital economy is the main source of its development. At the same time, the formation and subsequent development of the digital economy requires a significant increase in the number of specialists in higher education institutions in the field of information and telecommunication technologies for various fields of activity. It should be borne in mind that in a digital economy, interdisciplinary specialists are needed. A graduate of a high school in the period of digital transformation must possess the following skills (Podolsky & Pogozhina, 2016):

- integrate the knowledge gained in the learning process when solving practical problems;
- critically perceive the changes occurring in technics, technology and in general in the national economy;
- to find new solutions to the tasks in the profile of their competence, including solving multicriteria research tasks.

The concept of traditional higher education, most often found in Russian universities, primarily focused on the following provisions:

- systematic selection of the most capable applicants with high development potential;
- direct transfer of compulsory and, most often, excess knowledge from teachers to students (determined by state educational standards);
- a predetermined level of control over the student's learning;
- the formation of certain skills, knowledge and skills in practical classes.

However, in the digital economy, the traditional system of higher education is largely transformed.

The transition to a new technological order requires qualitative changes in the activities of higher education, a focus on raising the level of information and telecommunication technologies, and the development of the digital economy.

The modern approach to the transformation of higher education implies an integration orientation in solving the strategic tasks of internal and external growth (Volosovets, Kirillov, & Buyanov, 2017).

At the same time, the strategy of internal growth should be focused on expanding its penetration into the educational services market, modifying and creating new types of educational services.

The qualitative transformation of higher education on the basis of external growth factors, in our

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opinion, should be focused on the implementation of strategies for horizontal and vertical integration. In this case, horizontal integration is understood as the unification of its activities by educational organizations that provide similar services, and the vertical integration is the unification of its activities with organizations that use the labor of trained specialists of higher education and finance it.

It should be noted that in the process of horizontal integration, organizations of higher education in the medium- and long-term perspectives get a synergistic effect, which manifests itself in minimizing the total costs of the material, technical, labor resources and advertising campaign (at the expense of united advertising companies, a joint brand). In addition, the synergistic effect of horizontal integration of universities and institutions of secondary vocational education is expressed in increasing the level of quality of education, increasing the potential for innovative growth based on the same or similar technologies of an organizational, process, product nature, jointly carried out research and development management systems of educational processes.

Digitization of higher education suggests that the following aspects of the activities of universities will undergo changes:

- qualification requirements for teachers and employees of universities;
- changes in the content and organization of educational courses. This means not only and not so much the transfer of educational materials into electronic form, but also the creation of a more flexible system of education;
- automation of administrative and educational processes in the university.

Training of highly qualified specialists in the field of information and communication technologies for the accelerated creation and development of the digital economy, in accordance with the basic provisions of the Program, should be related to the provision of knowledge and skills of graduates to create the infrastructure of the digital economy, providing information interaction between individuals and socio-economic institutions and the state. A specialist in higher education in the field of information and telecommunication technologies must have the knowledge to actively participate in the network of centers for the collective use of digital equipment and unique scientific installations (Khairutdinov, 2018).

The requirements for a specialist in the process of developing a digital economy also determine new targets for higher education. The purpose of studying at the university is multilevel IT – training a competent specialist in the professional field and in the field of IT & IS.

The main result that should be aimed at the entire learning process at a higher education institution is the ability to solve practical problems arising in the conditions of a particular professional activity through the use of information and telecommunication technologies (Frey & Osborne, 2017).

In order to ensure the maintenance of a high qualification level of a specialist and the continuity of its development in the field of information and telecommunication technologies, the existing mechanisms for retraining, advanced training and self-education should ensure the competence of the digital economy necessary for specialists for the period of formation and development of digital economy.

At the same time, certification of the competencies of the digital economy should be consistent with professional and educational standards, the national qualification system.

Created educational programs of higher education should provide:

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- support of talented students in the process of forming the competence of specialists;
- designing and combining various educational and labor orientations of achievement in the medium and long term;
- the correspondence of the number of high school graduates to the needs of the labor market in the digital economy;
- application of state certification, digital tools in professional activities.

A specialist in the field of information and telecommunication technologies should also be able to participate in the implementation of integrated digital platforms for managing energy, water, transport and other resources (Kim, Kim, & Le, 2017).

In higher education, it is necessary to introduce a project approach to training more widely. The master should be able to develop strategic concepts and business projects, carry out work on their implementation, assess the quality and effectiveness of these projects. At the same time, it is possible to master the skills of design in the course of scientific and practical activities through the active use of e-learning.

The world practice of development of the higher education system indicates that a new role-based characteristic is assigned to a higher school – stimulating the entire spectrum of relations with the national economy (Shmyrova, 2010).

In the process of formation and development of the digital economy, higher education institutions should focus on increasing and expanding the number of educational programs related to the training of specialists in the field of information and communication technologies. At the same time, the quantitative growth of programs should be accompanied by the achievement of high standards of quality education in higher educational institutions. In this regard, the methodologies of planning, monitoring and reporting on the achievement of the set targets in the Digital Economy of the Russian Federation Program should be revised, a set of organizational, economic, scientific, innovative and investment measures for methodological support at the consolidated level of the Program implementation developed.

The business sector needs specialists who are well versed in the digital environment, who understand how to apply the latest technologies in their work and are focused on the continuous introduction of digital technologies and innovations. In the conditions of digitalization of the economy, the issue of joint research of business and higher education related to the development of digital technologies is becoming topical.

The introduction of educational services of higher education in the sphere of material production is one of the main incentives for scientific and technological progress, ensuring the acceleration of the transformation processes of the existing technological structure and the development of the digital economy (Potekhina & Shulinina, 2016).

Entrepreneurial structures are able to provide all possible assistance in updating the material and technical base of graduating departments, which, in turn, can qualitatively train specialists for specific industries. At the same time, undergraduates know where they will work after graduation. Such concretization and binding of the higher school to production allow a university graduate to join the solution of practical problems without a long process of adaptation.

Such cooperation by enhancing the interdependence and interconnectedness of higher education

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and business structures provides the manifestation of a synergistic effect (Podlesnykh, Goncharov, & Kuznetsov, 2012).

The combination of diverse structures that are developing at different rates and conditions (business structures and universities) should occur through the synchronization of their life cycle and speed of development. Synthesis of such structures into one is carried out by establishing the overall rate of their evolution. As a result of the combination of such structures, they fall into one tempo-world and begin to develop at the same speed, with the same target orientation towards digitalization.

As a result of such cooperation, the university could receive a more modern educational base and prepare popular specialists in the digital economy. Entrepreneurial structures in this case could provide themselves not only with personnel, receiving specialists who can solve actual practical problems, but also promote their own technologies and equipment to the markets (Heyman, 2016).

In Figure 01 the main directions of interaction and mutual influence of higher education and business structures are presented.

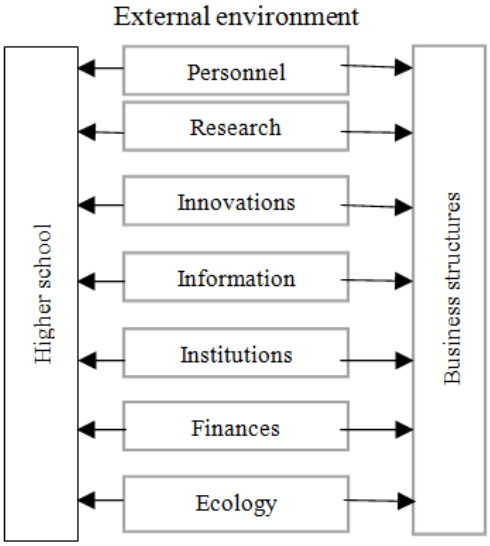

Figure 01. Directions of interaction between higher education and business structures

The training of specialists in the field of information and telecommunication technologies for the establishment and development of the digital economy should be accompanied by: the modernization of the technical regulation system in the process of expanding the main tasks of the development of the digital economy; development of modern methods and software tools for processing, recognition and decryption of spatial data; the creation of a system for forming and monitoring the implementation of targeted integrated programs and investment projects in the field of the digital economy.

To implement current and future educational inquiries of the digital economy, it is necessary to create a unified information and educational environment that will allow for planning, organizing and managing the educational process at all levels of education.

Thus, the integration unity of the training of qualified specialists in the information and telecommunications field by higher education institutions, the emergence and development of the digital

economy is the target for increasing economic growth rates on the basis of innovative transformations and participation in the new technological order.

7. Conclusion

The analysis shows the need for transformation of the higher education system, aimed at ensuring compliance with the requirements of the digital economy.

The change in the system of higher education should occur in the following key areas:

- formation of new educational programs;
- formation of new competencies of graduates;
- organization of interaction of universities with business structures.

The formation of new educational programs should ensure that the number of graduates meets the needs of the digital economy. This implies not only an increase in the number of educational programs in the digital economy, but also qualitative changes in those profiles and areas that provide traditional sectors of the economy.

New competencies of graduates are focused on: integration of theoretical knowledge in solving practical problems; willingness to perceive and act in a continuously changing external environment; readiness for continuous innovation and learning; ability to solve multi-criteria research tasks.

The interaction of universities and business structures should be carried out in a number of areas: personnel, research, innovation, information, institutions, finance, ecology. Interaction along these vectors ensures the synchronization of the pace of development of business structures and the higher education system.

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