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**ROLE OF SCIENCE AND EDUCATION IN SOLVING THE
PROBLEMS OF THE “KNOWLEDGE ECONOMY”**

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Abstract

The article aims to study the features of the formation of the “knowledge economy”, identify the role of science and education in this process, and determine the key characteristics and structural components of an academic university. The main positive results, as well as possible negative consequences associated with the introduction of the principles of “academic capitalism” in the educational sphere, are determined. The process of forming a new type of relations should not be associated with a change in the essence of science and education by giving them market characteristics. The specific role of science and education in solving the problems of new industrialization is shown; substantiates the need for new approaches to the development of human capital in Russia in the context of current technological challenges. The article examines the modern trend of changing the role of education as the basis for the formation of a new type of economic relations. It is concluded that in the conditions of the formation of the knowledge economy, the importance of education should increase; it covers society as a whole, providing opportunities to realize the creative and intellectual potential, which is the key to the innovative development of society.

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1. Introduction

Current trends associated with the formation of the "knowledge economy" are manifested in all spheres of public life, transforming it following the requirements of a new type of social relations. Under such circumstances, it becomes necessary to analyze the adequacy of the changes taking place in the educational sphere with the features of the formation and functioning of the knowledge economy.

2. Problem Statement

At the stage of the formation of a new knowledge economy, science and education are of great importance. The leading role in the knowledge economy is played by knowledge, intangible assets and especially intellectual capital (Popov, 2012); those employed in the sphere of knowledge become the main productive force of society. Knowledge and technologies for its production and dissemination are the sources of the growth of the knowledge economy. The study of the role and significance of science and education, the problems of the formation and development of the knowledge economy, as well as the experience of other countries in overcoming them, is especially relevant for the Russian Federation.

3. Research Questions

The work of domestic and foreign scientists is devoted to the study of the process of formation of the information society and the knowledge economy, among which are Buzgalin & Kolganov, (2003), Bell, (2004), Kleiner (2006), Moiseev (2004), Inozemtsev (2000), and Rubanov (2011). An analysis of new phenomena in the educational sphere, such as "academic capitalism" and a corporate university, is given in the works of Akimova and Shataeva (2020), Slaughter and Leslie (1999), Slaughter and Rhoades (2009), Mitin (2014), and Hackett (1990).

4. Purpose of the Study

The paper aims to study the features of the formation of the "knowledge economy", identify the role of science and education in this process, and determine the key characteristics and structural components of an academic university.

5. Research Methods

The methodological and information base of the work was scientific studies and publications on the role and importance of science and education in the development of the knowledge economy. The methods of systemic and logical analysis and generalization of information were used.

6. Findings

The current changes have affected all fields of human activity, which are based on the transformation of the relations of production prevailing until recently. The emerging new type of social connection comes,

by its nature, into conflict with the previous ones; there is a process of formation of a society, which some scientists define as a “knowledge society,” “information society,” or “new economy.”

It is necessary to consider the form of social relations, which today is undergoing significant transformations, to reveal the features of the changes. As is known, commodity and market relations, functioning as an organic system, have an objective process of development of scientific and technological progress as prerequisites for their emergence; this leads to the increased division of labor and specialization and the separation of the material interest of the producer. These framework conditions determine the essence of commodity relations: commodity relations become an activity that levels the role of a person and fixes the leading function for the product as a carrier of social relations of the person himself.

The essential characteristic of any organic system, including the system of commodity relations, is its ability for self-development; it is provided by the presence and resolution of the basic contradiction inherent in the system itself and present in all its elements. In its simplest form, this contradiction exists in the product, which forms the genetic basis of this system. The law stimulating the functioning and development of the system of mediated relations is the law of value. Therefore, not only the most efficient distribution of resources in society is objectively ensured to maximize the satisfaction of social needs, but also, as a result of the action of the processes of concentration and centralization of production and capital, a new type of market entity arises. The further development of a monopoly leads to the undermining of commodity relations.

Thus, the prerequisites for the formation of relations of a new type are laid within the system, the development of which within the framework of this system leads to the fact that the elements of new social ties contradict each other. The transitional nature of such a period is characterized by the preservation of old forms with the simultaneous manifestation of a new type of relationship in them that transforms the essence of market categories.

First of all, the category of labor as a source of value undergoes such a transformation, the interpretation of which under the conditions of the predominance of market relations reinforces its duality. The allocation of the abstract side of labor suggests the possibility of its qualitative and quantitative comparison. Under these conditions, the role of a person who carries out the labor process is reduced to the concept of a “private worker,” while the function of the main productive force is assigned to the means of production, which are the material embodiment of scientific knowledge. The main provisions characterizing the features of the “new economy” or “knowledge economy” are given in the scientific works of Schumpeter, Hayek, and Machlup and testify to the unity of views of scientists regarding the changing role of knowledge in social reproduction. They point out that the material factors of production are being replaced by the creative activity of the producer, and knowledge is becoming the most effective productive force.

Several scientists single out the defining characteristic of new relations, which is the change in the content of the labor process. So, Inozemtsev, analyzing the objective processes that accompany the formation of new social connections in modern society, reflected in the labor category, indicates that science-intensive and information industries play an increasingly significant part today. This gives rise to the prerequisites for the labor displacement as a type of human activity typical of the entire economic era by creativity, a qualitatively different type of activity that hides the main features of a post-economic society

(Inozemtsev, 2000). Unconditional and the only source of new value in the conditions of commodity relations is labor. However, already at the initial stage of the formation of the “knowledge economy,” one can state a change in the essence of the category of labor, when the “starting point for the development of the material life of society,” described as the “knowledge economy,” is creativity, which replaces labor (Buzgalin & Kolganov, 2003). Thus, current changes in the nature of work lead to an increase in the role of the creative and intellectual component of this process and the corresponding elimination of the executive-productive and routine nature of labor.

It is the creative component of the labor process and the creative potential of the employee that serves as the basis for the formation of the organization's intellectual capital, which, according to some economists, is becoming most relevant. For example, Moulrier-Boutang (2012) believes that intellectual capital appears as a significant productive force in society. It can be argued that scientific knowledge today is becoming a determining factor that affects not only the economic growth of society but also the essential transformation of production relations.

The formation process of the “knowledge economy” is manifested in the strengthening of trends that characterize the development of modern society at the global level. These trends are associated with an increase in the share of value-added in manufactured goods based on the introduction of innovations. This defines scientific research as the most efficient production resource. The use of this resource is not related to its material destruction in the production of a new product and is limited only by the legal framework of conditions, patents, and laws governing the use of the intellectual property. At the same time, this resource must be considered as an element of infrastructure, covering not only the production and commercial spheres but also the sphere of production of new knowledge: scientific institutes, specialized scientific departments of corporations, educational organizations, etc.

The trend is also manifested in the change in the content of the value of the produced goods. An increase in the share of expenditures of intellectual capital in a product lead to the gradual disappearance of its value; since the value is formed exclusively by abstract labor, and scientific activity does not imply the possibility of comparing it and bringing it into the form of abstract labor.

Current trends in the formation of the “knowledge economy” are associated with the rapid development of information technologies and their introduction into all spheres of human activity. This process ensures the reproduction of knowledge as a resource. The collection, transmission, and processing of information, including through the Internet, are inextricably linked with the production of new knowledge and its subsequent use in creating the public good. In addition, the development of distance learning, a system of remote training of employees, and online training and seminars provide conditions for increasing the educational and intellectual level of personnel, which is a requirement for the formation of a “knowledge economy.”

The considered changes lead to the emergence of new competencies of employees, which are associated with the presence of not only a high professional level but also their creative potential, the ability to effectively introduce innovations, and generate new knowledge. It becomes necessary to consider the current trend of changing the role of education as the basis for the formation of a new type of economic relations.

The growth of requirements for the level and volume of competencies of the employees on the part of the business is manifested in the formation of a new direction of activity related to the development of education units and their inclusion in the structure of the organization. Today, business is involved in the educational process, helping to develop a system of corporate universities, which, being divisions of corporations, perform the functions of raising the level of education of employees and become a significant factor in strategic development. The system of corporate education has become widespread at the global level. "For example, in the field of information and communication technologies, transnational corporations IBM, Microsoft, Cisco Systems and others have created globally distributed educational environments for continuous education" (Melnikova, 2004).

The activity of a corporate university, as a rule, has two courses. The first one is strengthening the personnel potential of the corporation, meeting the demand for skilled labor with specific knowledge following the specifics of the corporation's activities. In this case, the corporate university uses traditional forms of education, business training, advanced training courses, consultations, seminars, etc. The second course of activity is related to the generation and implementation of innovative solutions to specific problems that arise in the activities of corporations. Such a corporate university becomes an element of the implementation of corporate innovation policy.

The development of the system of corporate universities, along with other objective factors, increased its influence at the end of the 20th century. Competition in the educational sphere has intensified, which has led to some changes in its structure and principles of functioning. Under these conditions, classical educational institutions are faced with the problem of ensuring sustainable development and attracting additional financial resources. One of the ways out of this situation was "academic capitalism." For the first time, the situation that has developed in education was characterized by this term by E. Hackett in his work "Science as a vocation in the 1990s: changing the organizational culture of academic science" (Hackett, 1990). The concept of academic capitalism has become widespread due to the works of Slaughter and Leslie (1999) "Academic capitalism. Politics and the Entrepreneurial University", in which the activity of an educational institution is identified with any type of economic activity that is carried out in market conditions. Later, Slaughter and Rhoads's "Academic Capitalism and the New Economy" were published (2009). The authors interpret the concept of "academic capitalism" as the activity of the scientific and pedagogical staff of a higher educational institution and all its structural units associated with attracting additional funding. To maintain or increase resources, researchers and faculty should compete for external funding that is associated with market-oriented research related to various applied, commercial, strategic, and targeted areas. And whether this money comes in the form of research grants and contracts, partnerships with industry and government, technology transfer, or attracting more students who can offer higher tuition fees. Academic capitalism can be defined as the market or market-like activity of a scientific and educational organization, as well as its employees, to attract external funds (Slaughter & Leslie, 1999). Thus, "academic capitalism," as a new concept that emerged at the turn of the 20th–21st centuries, began to be identified with the process of developing entrepreneurial activity in the fields of science and education, aimed at "obtaining financial resources and expanding the public application of knowledge" (Mitin, 2014).

Analyzing the position of several authors who give their interpretation of "academic capitalism," the following can be distinguished. Grudzinsky (2004) sees human capital as the driving force for economic

development, which is formed by the teaching staff in an educational institution. Kalinkin (1990) understands "academic capitalism" as an economic category that reflects such processes as the capitalization of scientific knowledge to turn it into a priority resource, the use of which provides certain competitive advantages; the process of transforming knowledge into a category of goods. This provision is controversial, since the results of scientific activity, by its nature, presented in the form of new scientific knowledge in intellectual products, cannot be identical to the category of goods. The results of scientific activity exclude the possibility of using abstract labor for their creation, and, consequently, the possibility of forming their value.

An ambiguous attitude to the process of involving educational institutions and scientific institutions in the market environment is expressed by many scientists, which include Mitin (2014), Akimova and Shataeva (2020). In their works, they note the emergence of some problems and contradictions associated with the activation of the process of involving educational institutions in the system of commodity relations. The development of "academic capitalism," in their opinion, leads to the leveling of the foundations and principles of education and the destruction of its purpose and social mission, which is based on serving the whole society and solving social problems.

The problems associated with changing the content of teaching and academic activities and limiting their creative components are being updated. Conditions are being formed in which researchers and teaching staff should be considered only as hired labor, as "private workers," designed to increase profits. The realization of such a goal will stimulate the development of only applied areas in science, which are characterized by quick practical returns and high profitability, while fundamental research and innovation, "unattractive" to the market, will lose their leading role in ensuring the development of society.

Such trends contradict the formation process of the information society or the knowledge economy, slowing it down, and preventing the formation of information and knowledge as the material basis of a new historical stage of development. Making scientific activity, as well as the learning process into a commodity form, puts significant obstacles in access to them. In the context of the formation of the knowledge economy as a new type of relation, the importance of education should increase, which covers the whole society, providing an opportunity to realize one's creative and intellectual potential. This is the key to the innovative development of society.

7. Conclusion

In conclusion, this analysis has shown the process of forming a new type of relationship that conflicts with commodity relations changes the nature of the functioning of all elements of society, including education.

However, this should not be associated with a change in the essence of science and education by giving them market characteristics.

The education system, which has many problems in Russia, ensures the formation and development of human capital. The forming and development of the knowledge economy in the Russian Federation will become possible if the consciousness of society changes radically. The government should be aware that the foundation of economic growth is precisely knowledge and the ability to apply it at present. It is significant to maintain the balance that would allow one to organically combine education with science,

selectively approach the commercialization of scientific achievements and maintain the quality of higher education without turning it into a utilitarian one.

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