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Article

# Current trends in the development of the Russian economy as a challenge to vocational higher education

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**Abstract:** The article is an analysis of the current directions of development of the Russian economy in the context of sanctions pressure from technologically developed countries (countries of opponents). Sanctions restrictions determine many areas of the development of socio-economic processes in Russian society, acting as a kind of catalyst for the formation of technological sovereignty, rethinking their own capabilities to ensure national interests, and the formation of national mental security. The conditions in which the Russian economy has to develop represent a strategically important transition from the state of consumption of technological innovations that were proposed by the global external environment to the state of creation, production and scaling of its own technological solutions that determine the prospect of strengthening national technological and intellectual sovereignty. The innovative development of the Russian economy in the context of severe restrictions on world interaction and equal exchange of knowledge and resources requests national human capital, since it is he who is the key strategic resource that determines state competitiveness in the field of creating and developing current technological innovations that can provide and maintain the necessary pace of socio-economic development, as well as strengthen intellectual and technological sovereignty. In order for the national human capital to be able to provide the necessary level of socio-economic development in extreme conditions, high-quality vocational education is needed in the course of which highly qualified specialists of a new generation are formed with a set of knowledge, competencies, skills and personal qualities that can ensure technological sovereignty, mental security of the state and effective implementation of national interests.

**Keywords:** technological sovereignty; innovation; socio-economic development; innovative knowledge; knowledge economy

## 1. Introduction

The socio-economic development of Russian society is currently taking place in difficult and, at the same time, unstable conditions, but this does not make its socio-economic development at the present stage less constructive and more isolated from the main global socio-economic trends. Knowledge is the main resource that provides the necessary pace and directions for the development of significant socio-economic processes. Knowledge is a source of creating new technologies, forming the necessary competencies and skills, transforming evolutionary experience, restructuring and rethinking knowledge itself into new relevant forms that contribute to the emergence of new opportunities for using it for the benefit of a person and society as a whole. The need for knowledge in all spheres of human life as a source

of socio-economic development allows us to talk about the production of knowledge [1]. The result of knowledge production is innovative knowledge, which is:

- New knowledge that determines the evolution of development expands the horizons of humanity's knowledge of the world around it and encapsulates new opportunities for the development of scientific and technological progress. Analysis of the development of mankind allows us to conclude that the new knowledge contains two components: explicit (the one for the sake of which it was created) and latent (the one that currently remains out of sight of study);
- New knowledge, which is a transformation or rethinking of the existing and used by humanity, which allows the knowledge itself to become more convincing, gain greater practical usefulness, and gain scientific provability;
- New knowledge, which is the result of the penetration of knowledge from one professional field into another, adjacent, which can also become a source of new (innovative knowledge), **Figure 1**.

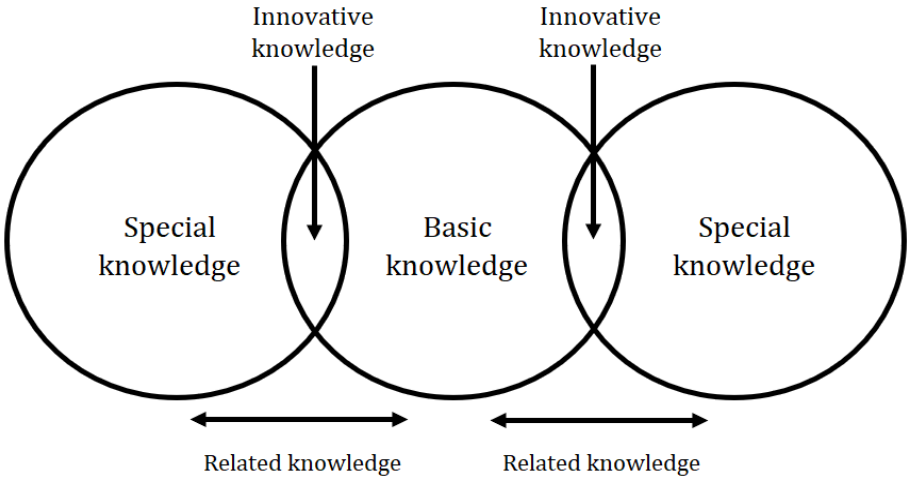


**Figure 1.** Innovative knowledge.

Despite the fact that the term "innovative knowledge" has been used in scientific research and practical activities for a long time, there is no definition that would be recognized as a reference (classical) term; therefore, it seems advisable to consider two components of its definition: innovation and knowledge.

Innovation: The term "innovation" in modern science and practice has numerous interpretations, but they all have a certain similarity, which is that innovation should contain an element of novelty. So, for example, according to Russian legislation, "innovation is a new or significantly improved product (product, service) or process, sales method, or a new organizational method in the business practice of organizing workplaces or in external relations" [2].

Knowledge: Humanity uses the term "knowledge" for a longer period of time than the term "innovation". However, this term, despite many interpretations and use in many scientific fields, does not have a classical definition that would be recognized as basic. But, in the most generalized form, the term "knowledge" can be interpreted as a product of mental logical activity aimed at comprehending the outside world. The product of mental activity in the form of knowledge of a modern person helps not only to comprehend the outside world but also to change (modify,

transform, etc.) it in accordance with your needs to meet urgent needs. Therefore, based on current realities, "knowledge is the result of mental logical activity that can be used to study the outside world, as well as its change in accordance with the current needs of man (humanity)". This use of knowledge contributed to the emergence of a knowledge economy at the present stage of development—this is a constructive result of its use to change the world (environment of existence). The negative result consists of man-made and environmental disasters, as well as irreversible changes in the natural environment of humans [3].

Based on all of the above, innovative knowledge can be defined as the result of thought activity that can be realized in a new solution to interaction with the outside world (cognition, change).

The knowledge economy is a key characteristic of modern global trends in socio-economic development, which also has many interpretations. The main element of the knowledge economy is that the strategic source of the socio-economic development of society is knowledge, in which knowledge can act both as a resource that is used to create material goods (innovative products, products, services) and as a technology that can transform the production process (automation, computerization, etc.) and as a product that has competitive new characteristics. In other words, in the knowledge economy, the commercialization of knowledge is the driving force behind the development of socio-economic processes. According to the Russian academic economist G. Kleiner, "We call the knowledge economy the state of the economy of a given country in which:

- Knowledge becomes a full-fledged product;
- Any product carries unique knowledge;
- Knowledge becomes one of the main factors of production" [4].

However, knowledge is the result of mental logical activity. Man is the main producer of knowledge, and for the production of demanded innovative knowledge capable of becoming a source of national development, "high-quality" human capital is needed.

## 2. Theoretical foundations (relevance of the study)

The Russian economy is currently experiencing an acute shortage of labor, including a shortage of qualified personnel. On the one hand, the shortage of labor can be explained by demographic problems that have been observed in Russia over the past decades [5]. However, similar demographic problems are observed in many technologically developed countries [6,7]. Two-thirds of humanity live in countries with fertility rates below the reproduction rate of 2.1 children per family. By 2100, the population of some large economies will decreaseby20%–50%, according to UN forecasts [8]. Rapid technological development has made the problem of labor resources global. National labor markets in many countries of the world are experiencing a shortage of labor resources, while the shortage of highly qualified specialists, who form the basis of national human capital, is very acute due to the development of digital technologies. On the other hand, the shortage of qualified personnel in Russia can be explained by the wave of immigration that was observedin2022[9]. However, the opposite trend is currently observed [10].

The development of digital technologies has contributed not only to the acceleration of globalization processes but also to the intensification of the struggle for technological leadership. The development of innovative digital communicative technologies is not only an indicator of the realized opportunities for the production of advanced technologies, the efficiency of the use of human resources for the benefit of the development of society, and the quality of national human capital, but also a factor in improving the quality of life. According to the results of the network activity index of 2024, which is aimed at analyzing the level of development of information and communication technologies and the network economy, Russia is in 41st place in the ranking of 133 countries in the world [11]. The network activity index is currently an important indicator of the innovative and technological potential of the countries of the world, as well as the possibility of development in the field of high technologies and the digital economy. For Russia, which sets itself the strategic task of achieving technological sovereignty, this position in the world ranking forces us to rethink the direction of many socio-economic processes in order to achieve the necessary national goals. Russia takes note of the results of the rating, but puts the achievement of national goals as a more important area of development. In the results of the rating by the level of innovation in 2024. Russia takes the 59th position [12]. When forming an innovation index, two groups of factors are taken into account:

- The first group of factors includes the resources that the country has and the conditions that exist in it for innovation: institutions, human capital and research, innovative infrastructure, development of the domestic market, and business development;
- The second group of factors is formed by the achieved practical results of innovation: the development of technologies and the knowledge economy, the results of creative activity.

Analysis of global trends suggests that the strategic goals of the national development of the Russian economy and society are in line with global trends and directions, despite the restrictions imposed by opposing countries, which in some way impede the necessary pace of socio-economic and technological development to achieve and strengthen national goals [13]. Therefore, the main strategic resource that ensures development is national human capital, which, as confirmed by the international institutions that make up the ratings, is the main source and resource for innovation and creativity, opportunities for the development of digital information and communication technologies. One of the most effective ways to develop and improve the quality and feasibility of human capital in the economy is education. Education can be considered both the basis for the formation and creation of human capital and technology that allows its continuous relevant improvement and development, taking into account the needs of society. The need for education acquires the status of necessity in modern society, since it is education that contributes to the implementation of dynamic rates of development in all spheres of life and economy.

Over the past few decades, Russian education has undergone many changes, the purpose of which was to provide the national economy with young specialists of a

new generation, capable of producing the knowledge necessary for the formation of the knowledge economy, the creation of innovative industrial and social technologies that increase the country's competitiveness in world rankings, and contribute to the constructive development of Russian society and economy. Knowledge production allows us to consider knowledge as a product, and this product should have competitiveness and attractiveness both for investors who take part in the creation and implementation of knowledge of both a market product and for consumers of knowledge who buy it in the form of a new product, technological solution or innovative service. Innovative knowledge "materializes" acquiring the status of a "product with new properties", the need for which is experienced by the economy and society, which enhances the value of both the knowledge itself and the result of its "materialization".

## 3. Methods and materials

This study uses basic scientific methods of cognition, which are considered classical:

- Problem analysis methods were used to more accurately formulate problems and the main elements included in its composition;
- Methods of comparative analysis and comparison were used to determine trends and directions for the development of socio-economic processes in the Russian Federation and world practice, including in the field of education;
- Observation methods were used to analyze patterns of behavior and social interaction affecting the effectiveness of the educational process identified during the study;
- Synthesis methods were used to identify the consistency of development trends and their significance for the effectiveness of socio-economic processes that determine national development;
- In addition to the above, other scientific research methods were used, which are necessary for a deeper understanding of the research problems and interpretation of the results obtained.

Humanity has never doubted the relevance of the demand for knowledge, because it is the development and assimilation of experience, processed and transformed into knowledge, that determines the evolutionary development of human civilization [14]. The processes of accumulation, transfer, multiplication and production of knowledge contributed not only to evolutionary development but also to the formation and transition from one socio-economic way of organizing society to another (primitive communal, slave-owning, feudal, capitalist, industrial, post-industrial). Education is a key strategically important way to acquire and disseminate knowledge from teacher to student. The fact that education is a global social value of our time is evidenced by the fact that the availability of quality education is one of the UN sustainable development goals [15] and a strategic national project of the Russian Federation [16].

Despite the development of digital technological solutions that contribute to the multiplication of methods and methods for organizing the transfer of knowledge to a student (student), the learning process itself remains conservatively classical and

unchanged from the moment of its inception, which allows it to be considered as an interaction process between student and teacher. If we consider the process of learning in higher school, the educational process is a student interaction (pupil) and a curator (teacher), whose purpose is to transfer professional knowledge in a certain area of activity and to form skills for using the knowledge gained in practical activities—skills (**Figure 2**).

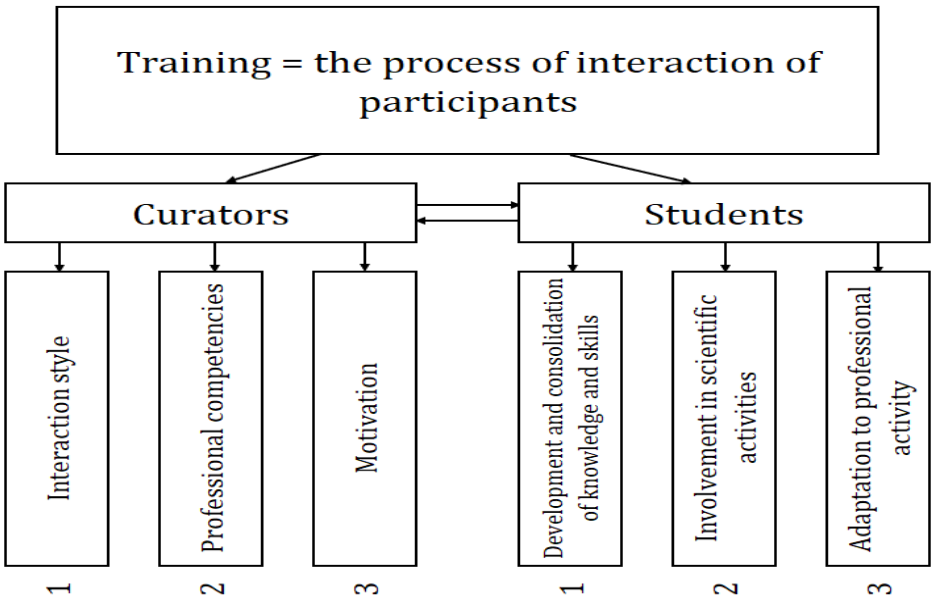


**Figure 2.** Structure of the educational process.

The effectiveness of the educational process is influenced by the personal characteristics of both the student and the teacher, which is probably why since ancient times it is believed that it is very important to "meet" your teacher. History knows many examples when a meeting student with "their teacher" became a prerequisite for the formation of a talented scientist, a great scientific discovery, the development of a new field of knowledge, etc. For example, the meeting of *Z.* Freud with Theodor Meinert determined the formation of *Z.* Freud as a scientist and his creation of a new scientific direction (psychoanalysis). In turn, the meeting of *Z.* Freud with Karl Gustav Jung also contributed to the formation of *K.* Jung as a scientist and founder of analytical psychology [17].

Considering training as an interaction process in this study, the main characteristics that determine the effectiveness of this interaction according to the researchers were highlighted. Efficiency in this case means mutual enrichment of the interaction environment (educational environment), motivation and involvement in the training process of all participants in order to obtain (transfer) knowledge and form opportunities for its practical use in professional activities. Performance means the assignment of knowledge, the development of professional thinking, and the formation of skills among students, as well as the realization of the possibilities of professional and personal development of the curator.

The effectiveness and efficiency of the educational process is influenced by such characteristics of the curator as a person and a professional who plays a leading role in the educational process:

1) Style of interaction: The style of interaction of the curator with the student during the implementation of the educational process affects the formation of the student's motivation for the studied area of knowledge, trust in the curator as the main source of knowledge in this area, the development of creative and critical thinking in the student, respect for the professional competence of the curator, etc. The interaction style can be seen as a "calling card" of the faculty portfolio.
2) Professional competencies: The modern rapid development of digital technologies contributes to the fact that the achievements of scientific and technological progress in one area are practical in many related areas, which requires continuous professional self-development from the curator and contributes to the formation of authority and trust among students.
3) Motivation: Professional activity in education requires a person to have certain personal qualities that are fundamental to the performance of professional activity and continuous professional self-development. Among the qualities that belong to the personality structure of the curator (teacher) are cognitive activity and motivation to study the world in order to obtain new knowledge or transformation (expansion, changes, additions, etc.) and search for opportunities to apply innovative knowledge in new technologies to meet current social needs. But, a good teacher should be motivated not only to constantly replenish his own knowledge and competencies, but also to convey (teach, share, involve) his knowledge to students.

For a student whose interaction with the curator takes place as part of the educational process and who plays the role of a follower in this interaction, the following characteristics are important:

1) Opportunity to develop and consolidate knowledge and skills: The learning process involves acquaintance with new knowledge for the student, while each student has his own individual knowledge landscape. The element of novelty is a source of stress from the point of view of physiology; therefore, in order to adapt knowledge and its better assimilation, it is necessary to provide such conditions of the educational process that contribute to the adaptation of the newly acquired knowledge into the individual landscape of the student's knowledge. In order for knowledge to successfully integrate into an individual landscape, it is necessary to be able to use the knowledge gained in different professional situations or in different fields of professional activity and related fields.

2) Involvement in scientific activity: The modern development of any professional field of activity is associated with scientific and technical achievements, which are currently dynamic in nature due to the continuous emergence of innovative knowledge and innovative technologies. The involvement of students in scientific activities contributes to a deeper understanding of professional knowledge and the possibility of developing and implementing creative thinking in the professional field or related fields, which is the basis for the formation of highly qualified specialists capable of creating innovations (knowledge, technology, solutions, etc.). In addition, involvement in scientific activities contributes to the future desire for professional self-development, which becomes a source of rational proposals for improving the efficiency of business processes in the workplace.

3) Adaptation to professional activity: in order to become a good professional, it is necessary to adapt to the peculiarities of the implementation of the chosen professional activity. Professional adaptation is a process that stretches over time and accompanies a person throughout his working life, but he begins with training in the profession. The first meaningful meeting with professional ethics and culture, the peculiarities of the implementation of this professional activity, and the necessary set of theoretical knowledge, practical skills, and personal qualities necessary for successful entry into the profession—all this happens in the process of training. The initial professional adaptation that takes place during training lays the foundation for the formation of professionalism in the future if it happens successfully (effectively). But, if the primary adaptation was unsuccessful, then the student may lose interest in this area of activity.

Thus, the learning process initially presupposes the presence of certain motives, values and motivation on the part of both the teacher and the student. The development of digital technologies contributes to the enrichment of the educational environment, expanding interactive learning opportunities, which contributes to deeper involvement not only in the educational process but also in professional activities. Early involvement of the student in practical professional activities contributes to the formation of the perception of the profession not only as a source of income and a certain guarantee of social stability but also as an opportunity for creative realization in the profession, forming motivation for creation and self-expression. One of the ways of professional creative implementation is to create innovations.

## 4. Results and discussions

As already noted in this work, education is one of the most effective and reliable ways to gain knowledge in the modern world; therefore, education is a global social value [18]. Education as a value has a direct or indirect impact on such social processes and characteristics of society as life expectancy, the level of technological and social development, the quality of human capital and social security, the ecology of consciousness, etc. In the ranking of countries in the world according to the human capital index for 2023–2024, Russia ranks 56th among 199 countries. The index indicator for 2024 is 0.821; for comparison, in 2015 the human development index in Russia was 0.798 (57), and in 2010 the index was 0.719 (65). The growth of the indicator is indisputable evidence that Russian society seeks to increase the opportunities for the development of national human capital, assessing it as a strategic resource, the main way to increase the potential of which is the effectiveness of national education [19].

The use of the classical model of the educational process in Russian higher professional education contributes to the preservation of national traditions of education (Russian higher education), which have proven their effectiveness. Enrichment of the educational environment through the introduction of advanced innovative educational technologies contributes to a faster formation of sustainable motivation among students for professional knowledge, interest in the possibilities of professional self-realization, and further professional development. It is worth noting

that in the Russian educational system there is not only an enrichment of the educational environment, but also its constant expansion. The goal of which is to increase the efficiency of involving students, especially in the chosen professional or scientific field of activity, and the ability to comprehend the basics of related professional fields of activity, which expands the formation of demanded knowledge, skills and competencies necessary for new generation specialists to compete in the labor market. It is also worth noting that Russian companies have become more likely to invest in scientific research and technological developments at universities, which also has a constructive impact on the entire educational process [20]. Moreover, the Priority-30 state program aims to "concentrate resources to ensure the contribution of Russian universities to achieving the national development goals of the Russian Federation for the period up to 2030, as well as to ensure the participation of higher education institutions in the socio-economic development of the subjects of the Russian Federation" [21].

The effectiveness of current socio-economic processes in the modern world depends on the ability to anticipate and quickly adapt to dynamic changes that occur in many areas of life almost simultaneously. Rapid changes that radically transform, sometimes chaotically, many socio-economic processes require innovative technological solutions that are revolutionary in nature. The source of the creation of breakthrough technologies is innovative knowledge, creation and use, which determines the competitiveness of the national economy. Education is one of the key ways to cultivate innovative professional thinking among students, the presence of which allows us to talk about them as specialists of a new generation.

Dynamic changes in needs that occur in the knowledge economy are the root cause of the current challenges of modern engineering practice, suggesting a wider range of professional skills and skills in related fields than those provided by Russian academic engineering education at the moment. The ongoing changes in global technological development contribute to the realization of the strategic importance of technological innovations for the economic competitiveness of the Russian economy and the formation of technological sovereignty. There is a worldwide awareness and recognition that technological leadership in innovation is the core of national well-being, competitiveness and development, ensuring technological sovereignty and national security in a knowledge economy. This fact, which determines the importance of innovation, is the basis for the feasibility of a global ranking of countries according to an innovative development index.

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